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# MOTOR BOATING



TODAY



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has been our policy for 20 years. During this time we have grown to occupy first place, in the opinion of the boating public, for reliability and perfection. We have stock sizes and types which have gradually been brought to a state of perfection not approached by other makes. An ELCO boat has distinction of design and workmanship easily recognized by the most casual. An ELCO engine shows its quality by the fact that for four consecutive years it has won the Long Distance Race, New York to Poughkeepsie and return, 132 miles, against all others.

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Madison Square Garden.

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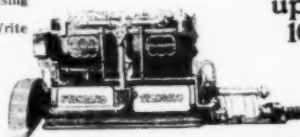
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Back of the Guarantee of the Engine is the

STANDARD MOTOR CONSTRUCTION CO.

178 WHITON STREET

JERSEY CITY, N. J.



"Power  
up to  
1000"

Princeton, N. J.  
January 20th, 1911.

Mr. George Hughes,  
Bayonne, New Jersey.

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Very truly yours,  
GEORGE FREDERICK.



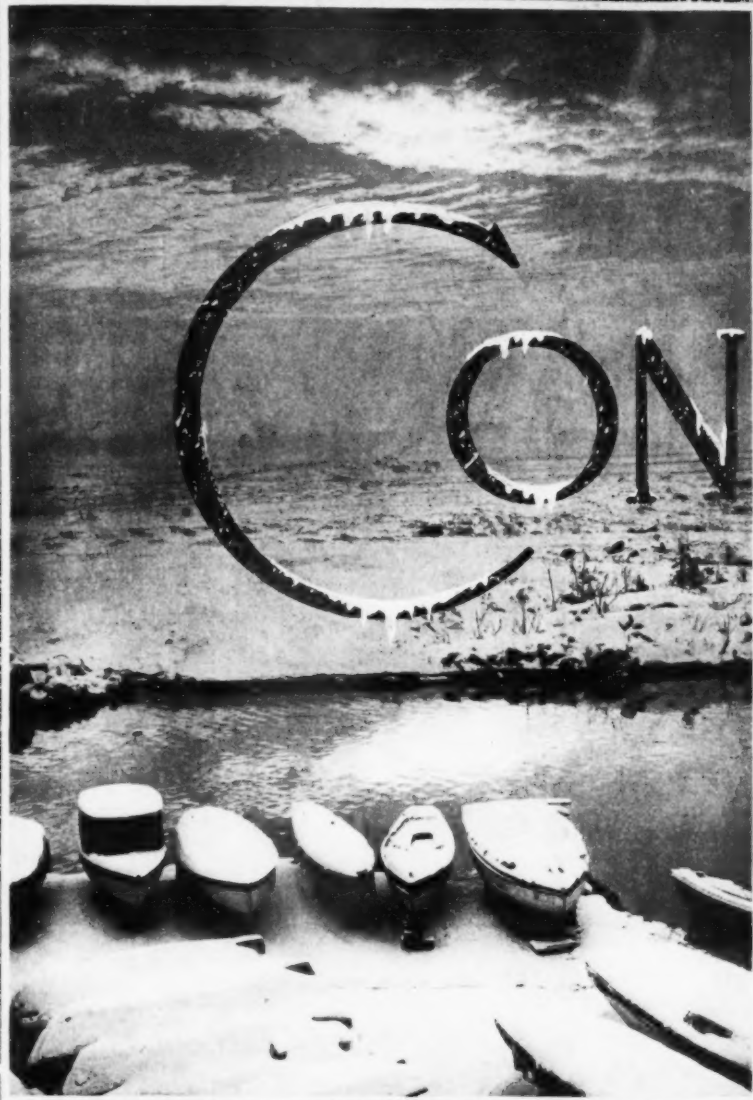
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Photograph by Rosenfeld.

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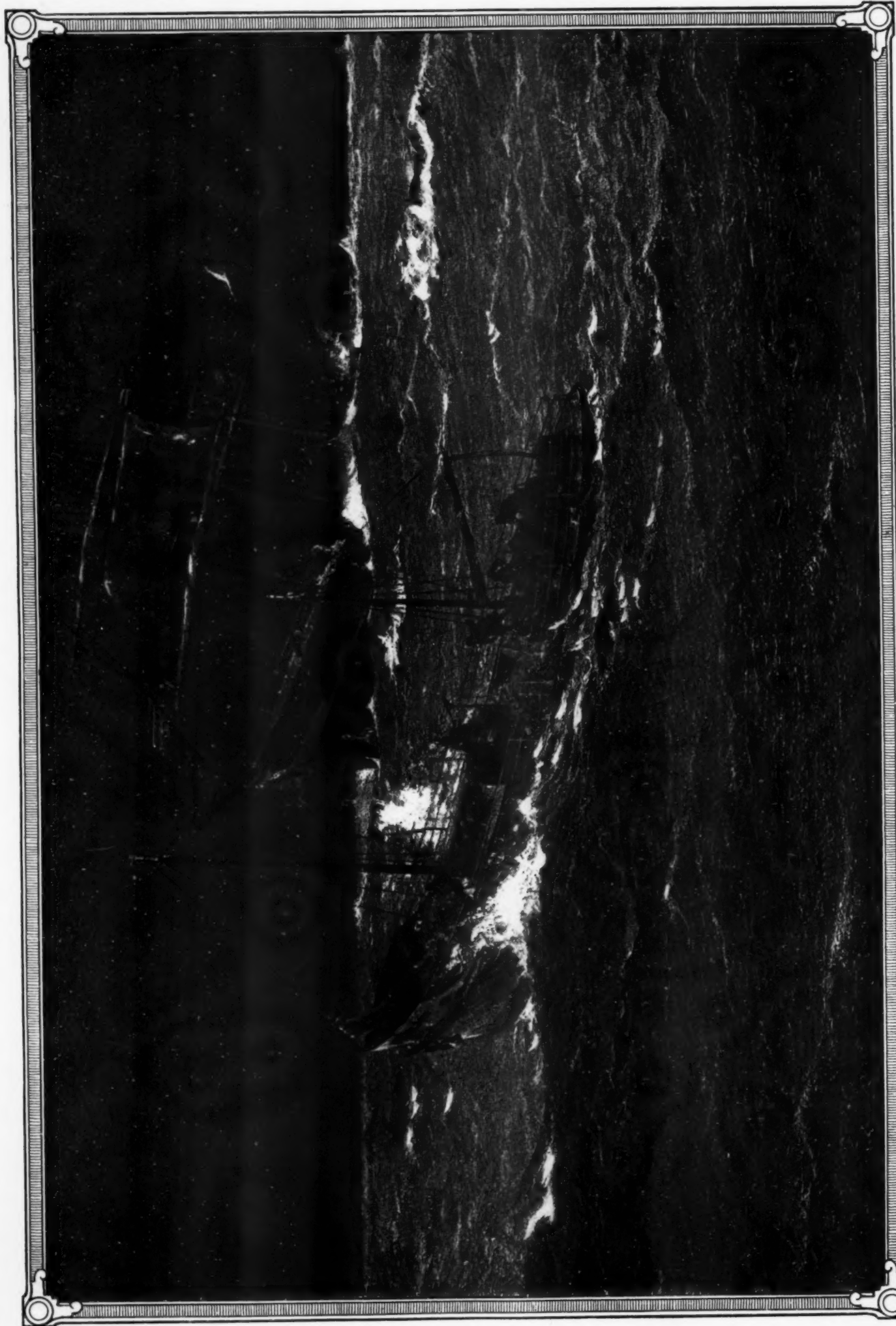
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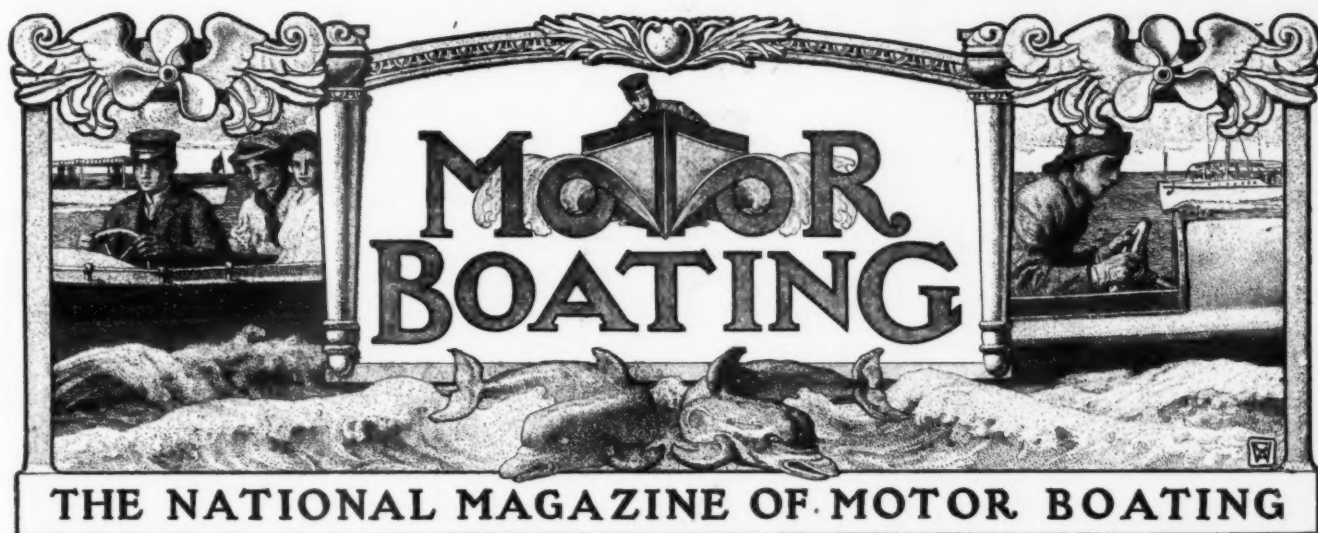
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**There's romance in the work of the motor lifeboat. This picture, reproduced from a Dutch oil, shows the lifeboat Brandaris on the night of September 30th, when she made her first and most spectacular rescue. See photograph opposite.**





THE NATIONAL MAGAZINE OF MOTOR BOATING

## The Motor Boat Shows.

The First of the Big Annual Eastern Exhibitions Now in Full Swing at Boston.  
Madison Square Garden Again to House the New York Show.

THE show season is here again—and welcome. The Boston show, the first of the big eastern exhibitions, is now in full blast, and its increased list of exhibitors indicates the rapid growth in popularity of motor boating, not only as a sport, but as a serious industry as well. When enough people want anything badly enough, there will be forthcoming a supply to meet the demand, and in this case the supply, in the nature of improved and refined engines, boats and accessories, is the criterion of a steadily growing demand.

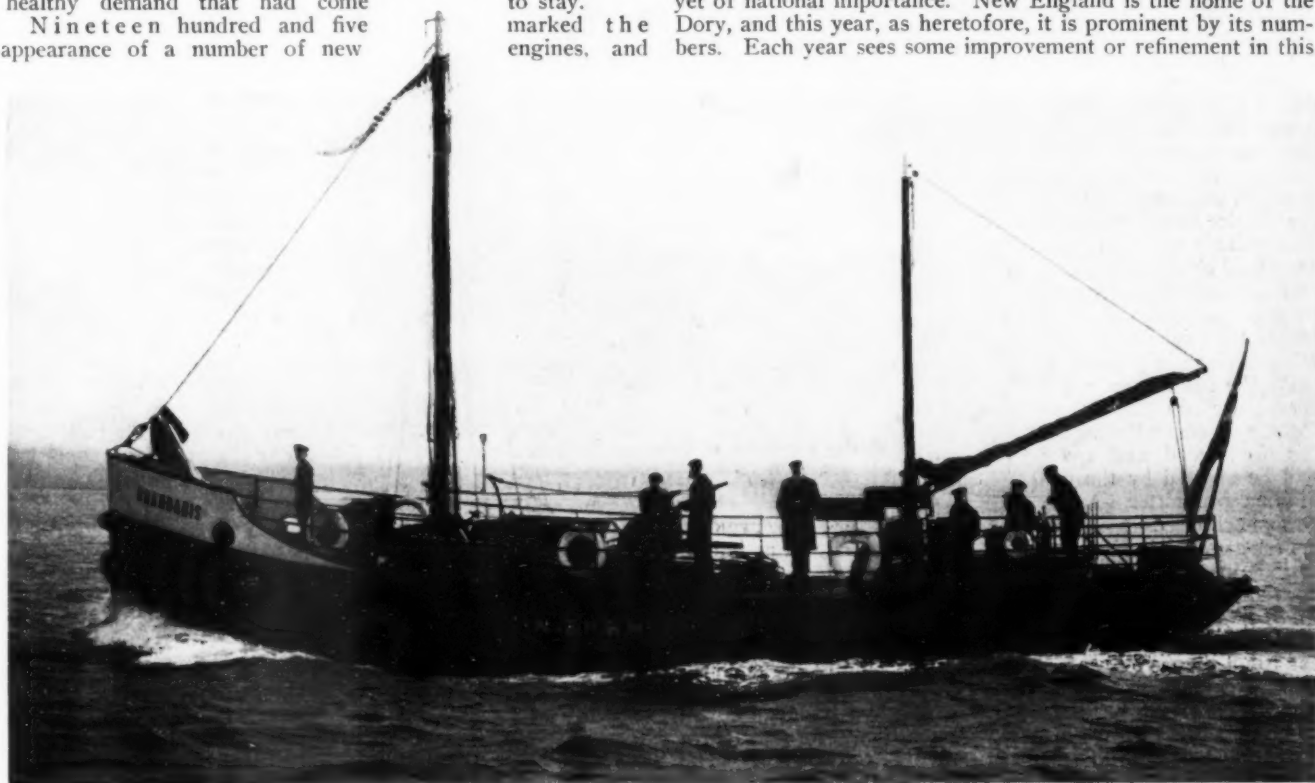
In 1904 Boston held its first motor boat exhibition. This was in connection with the automobile show in Symphony Hall. Designers and builders were somewhat backward in coming forward while the industry was in its infancy, but the success of this early show in the way of advertising and actual sales and orders convinced the exhibitors not only of the value of a motor boat show, but of the healthy demand that had come

Nineteen hundred and five appearance of a number of new

presence of a to stay. marked the engines, and

about this time several of the naval architects, who had heretofore been devoting their attention to steam-driven craft, turned their attention to the motor boat, and a number of concerns actually started the manufacture of stock models. At the earnest solicitation of the officers of the New England Boat and Engine Association, the entire basement of Mechanics Building, in which the automobile show was being held, was given over to the exhibits of motor boats and engines.

For two years more the association was content to exhibit as a part of the big motor car exhibition, but in 1907 the popular interest had grown to such an extent that the old arrangement proved utterly inadequate, and so in 1908 Manager Campbell decided to hold an independent exhibition for the motor boat industry alone. That same year shows were held in Chicago and New York, and Boston had not only the principal exhibitors at these exhibitions but also numerous New England firms not yet of national importance. New England is the home of the Dory, and this year, as heretofore, it is prominent by its numbers. Each year sees some improvement or refinement in this



Brandaris, the Dutch motor life boat that figures in the frontispiece opposite. A description of the boat appears on the following page.

type of craft, until it has lost practically all of the crudeness of the original slab-sided craft of the deep-sea fisherman, without, however, losing any of the seaworthiness inherent in the type.

The runabout is coming more and more into favor, and in lines this type of craft is practically standardized. Many of these boats, however, are now being built with the V-shaped bottom, which lessens the cost of construction without detracting in the least from the speed or seagoing qualities.

In engine design the tendency is toward marked differentiation into various types, and there are now three well-defined classes—namely, high-speed, medium-duty and heavy-duty, and many manufacturers are now turning out models in all three classes. This differentiation goes hand in hand with, and is probably a result of the marked tendency to differentiation in the boats themselves, according to the service for which they are to be used. "High cost of living" seems not to have invaded the motor boat field to any marked extent as the standardization and increased production have more than counteracted any higher cost of materials in their influence on the finished product.

Descriptions and illustrations of exhibits at the Boston Show appear on pages 23 to 30, inclusive.

### The New York Show at Madison Square Garden.

THE eighth annual exhibition of the National Association of Engine and Boat Manufacturers, which was to have been held in the 69th Regiment Armory from February 17th to 24th, will be held in Madison Square Garden, as formerly. This comes as a pleasant surprise to most of us, as we had expected that the work of demolishing the historic old show place would by this time already have been commenced. It is understood that the owners of the building have been guaranteed a sufficient rental by the various organizations that exhibit there, to warrant this change of plans, and we shall look forward to many other exhibitions in this, the most famous exhibition place in the world.

As the old contracts for space are no longer in force, new contracts are being forwarded and space will be allotted by the exhibition committee to conform as closely as possible with that applied for at the armory. As far as possible also, the exhibition committee will assign locations in the same relative positions as were occupied at the 1911 show. The price of space on the main floor is at the rate of \$1.75 per square foot with boat exhibits given preference as to location. There are already enough boat spaces applied for to fill the entire center of the arena, while the wall spaces will be devoted to engine exhibits, as was to have been the case at the Armory. Spaces on the elevated promenade will be occupied by displays of accessories, as heretofore and these spaces will cost \$100 each as against \$160 last year. The restaurant space on the main floor will also be used for the exhibition of boats and engines and this space will rent for \$1.50

per square foot. The concert hall above will be devoted to accessories and space may be had here at the rate of \$1.00 per square foot.

The March issue of MoToR BoATING will be the New York Show Number and considerable space will be devoted to descriptions of the various exhibits to be seen there.

### The Frontispiece.

THE frontispiece of this issue was reproduced from a Dutch painting of the motor life boat *Brandaris*, a photograph of which appears on the preceding page. This scene is not merely the product of the artist's imagination, but is a faithful picture of the boat in action during her first and most spectacular rescue on the night of September 30th, and it gives a comprehensive idea of the conditions with which such a boat must contend.

*Brandaris* was built and engined by D. Goedkoop, Jr., at the Kromhout Ship Building and Motor Works, of Amsterdam, Holland, for the North and South Dutch Life Saving Society. She was intended for service along the coast and her station is at West Tarschelling, near which town there are numerous and dangerous sand bars and reefs. She is 47 feet 3 inches over all, by 14 feet 8 inches beam, and is propelled by a 2-cylinder, slow-speed Kromhout oil engine developing 100 horse power at 260 r. p. m. When once under way she may be reversed and controlled entirely by the helmsman.

*Brandaris* is considerably larger than our own motor life boats and her service is utterly different. She is used more to patrol the coast than for occasional service such as is required of our own boats, and accommodation for the crew is therefore necessary, which means, of course, greater size.

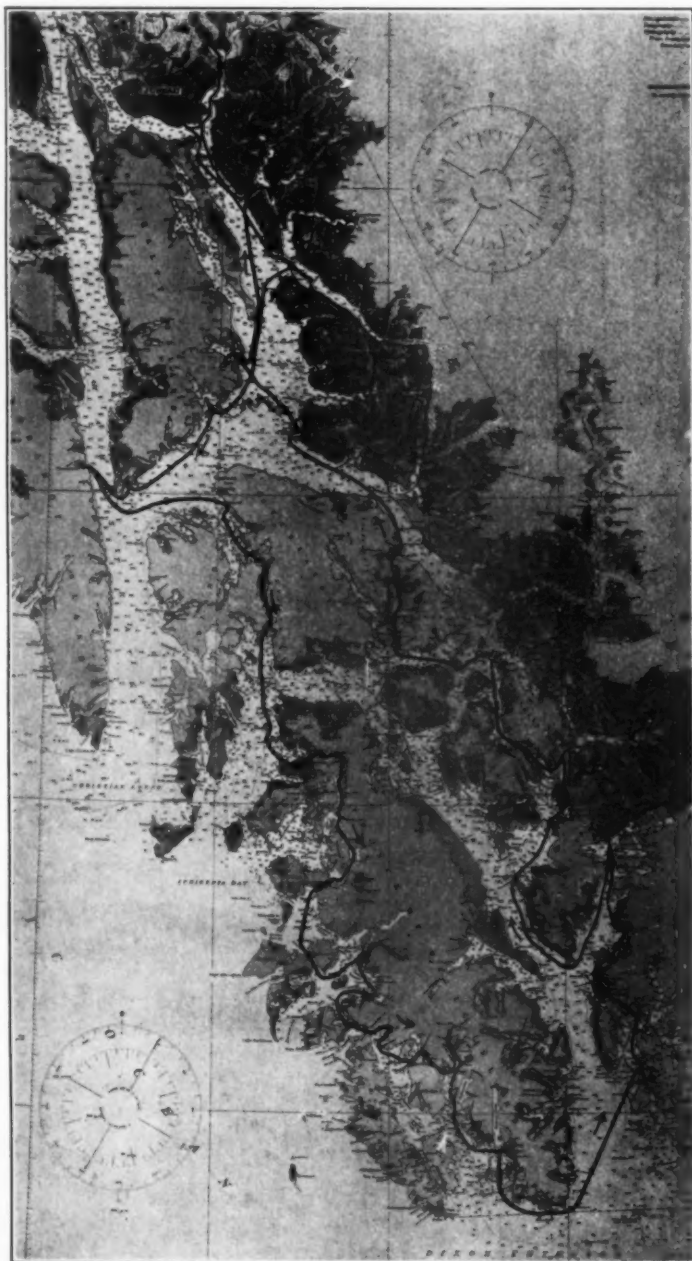
### The Cover Design.

JUDGING from the numerous letters we have received since the appearance of the January issue, we take it that you liked the cover. We thought you would. Mr. Stoddard's work has a human-interest touch that "gets right down under the skin," and this picture was the best he had ever done for us. Next month we shall have another good one by the same artist.

In his painting of the motor yacht under auxiliary sail, on the cover of this issue, Mr. Todahl has given us a picture that not only is faithful in its representation of the boat, but, in the masterful handling of the color, the action, and the whole spirit of the sea, is far above the work usually found on the covers of magazines.

In these covers we are giving you what we consider the best and we hope that it "gets there." If you like the covers let us know about it and if you have suggestions for better ones, or in fact if you have suggestions for the betterment of the magazine as a whole or any department of it, let us have these too.

We want the criticisms of the man we are trying to reach—the motor boat man.



The course of the 1000-mile cruise from Juneau, Alaska, among the islands of the coast, with their picturesque scenery and primitive civilization.





# *A Thousand Miles through Alaskan Waters.*



The writer goes a'fishing

LEAVING Juneau about the middle of July on the stanch and speedy motor cruiser "Iowa," owned and captained by "Billy" Dickinson, who knows every nook and corner of the maze of islands, bays, straits and sounds of southeast Alaska, we headed down Gastineau Channel to look into various matters which certain people in Alaska find it profitable to hide from government officials.

The "Iowa," on which the cruise was made, was built in Juneau in 1907, and is one of the best cruising launches in Alaska. The vessel, which has a gross tonnage of 12 and a net tonnage of 8 tons, is 41 feet 6 inches over-all, with 9 feet 7 inches beam and 2 feet 7 inches draft. The

cabin is fitted up with two double lower and two single upper Pullman berths, while two additional berths are provided for in the engine room and a temporary one in the pilot house. Her motive power is a 32-H.P. Standard engine.

The first temptation to deviate from a straight course was at Taku Inlet, an immense fiord which cuts back into the mainland some twenty miles, at the head of which the Taku River, a shallow, turbulent stream, which has its rise in Canada near the headwaters of the Yukon River, debouches into the Inlet. It is from this that the Taku winds, which shake Juneau to her very foundations during the winter months, emanate.

At the head of the inlet are to be seen probably the most remarkable and beautiful scene in all Alaska, two g'a-

By John N. Cobb

ciers, one "live" and the other "dead," as they are termed, almost meeting here. We slowly passed along the face of the "live" one, so called because it still discharges its icebergs into the water, while the "dead" one is slowly receding from the shore, at a distance of about one hundred yards, and it was a grand sight to look up at that stupendous mass of ice looming some hundred and fifty feet above us, the ice varying in color from pure white to purple, while the top was broken up into innumerable jagged peaks. Every few minutes masses weighing many tons would break off, adding more to the many icebergs already floating in the inlet, and through which we had to carefully navigate our way when approaching the glacier. Many of these bergs were of odd and fantastic shapes, one in particular resembling a huge swan floating on the surface.

Calling in at Taku Harbor we went through the salmon cannery and fish freezer of the Taku Canning & Cold Storage Company, and witnessed the interesting processes incident to this great industry.

Off the eastern side of Admiralty Island, between Gambier and Pybus bays, is one of the best salmon trolling grounds in Alaska, and we found a number of fishermen in light rowboats trolling along here and meeting with such success that it almost

broke the hearts of the anglers in our party not to be able to stop long enough to enjoy the fun.

We stopped for a few hours at the whaling station of the Tyee Company, but found it quite deserted, owing to the fact that the company had closed up the shore plant and, fitting up a floating plant, had gone on to Kodiak, nearly a thousand miles away. While it was much duller it was very much sweeter than when in operation. We somewhat consoled ourselves by going on a crabbing expedition in the bay and secured about a dozen fine large crabs with a long-handled dip net.

We anchored for the



Iowa, while not beautiful, is a real boat well appointed for northern cruising.

night in Warm Springs Bay, Baranof Island, one of the most beautiful bays to be found in the whole world. A magnificent waterfall discharges into the bay at its head, and close by are the four or five medicinal springs which are the chief attraction of the place. Two small stores, a sawmill and about twenty houses form the little village, which is much resorted to by those suffering from rheumatism, etc.

Early in the morning the engineer, an eager sportsman who volunteered to work his way, and the collector were up and fishing from the float, and caught about eight "black bass," a most delicious fish resembling in appearance the real black bass, and a large halibut. The latter was so big, however, that he could not be landed with the insufficient appliances at hand.

Our next port of call was Kake, an Indian village at the head of Kupreanof Island. The Society of Friends maintains a missionary here. But few of the Indians were at home, being employed at the Pillar Bay cannery during the summer months. This village contains the most turbulent Indians to be found in all Alaska. The doctor, or medicine man, exercises absolute sway over the tribe, and the members are ready to do almost anything, even to murder, should he order it done. At a salmon-curing plant here I saw the largest king salmon probably ever caught; it weighed about 125 pounds.

We then took a short cut to Sumner Strait, by way of a channel most aptly called Rocky Pass. It is a very narrow passage and one quite difficult owing to the many islands and false passages encountered, in which the unwary are easily entangled. In the fall it is a great resort for ducks, geese, swan and snipe, while deer and bear are often to be seen along its shores. The passage is about twenty miles long, and we anchored for the night at the lower end, and spent most of the night fighting mosquitoes instead of sleeping.

Leaving Rocky Pass early in the morning we crossed Sumner Strait and passed into Shakan Bay, and visited the Indian village of the same name, where there is a salmon cannery. Shortly before high tide we entered Klawak Passage, a narrow inside passage extending about one-third the length of Prince of Wales Island. The entrance was between two small islands, which were almost entirely covered with Indian graves. Most of these were covered with miniature houses, and on looking

through their windows we could frequently see the coffin lying on the floor. In one a table was standing close by the window. It was covered with a table cloth and on it were the dishes ordinarily seen on an Indian table when a meal is in progress. The dishes all held various articles of food, dried with age, while the inevitable can of condensed milk and bowl of sugar stood handy. Back of all was the coffin containing the remains of the deceased. Several of the graves were marked by handsomely carved totems of the bear, salmon and whale.

A short distance beyond the islands is the narrowest spot in the passage; so narrow, in fact, that the trees almost meet overhead. For a number of miles it was like floating down a river, the only sign of life being when a salmon would jump from the water, or a sea gull swoop inquisitively within a few feet of our heads.

We reached Deweyville, our anchorage for the night, at 5 P. M., and while the anglers got out their tackle in order to whip the stream for trout, I tried my hand at dipping from the water with a small dip net some of the countless thousands of young salmon which were wending their way from the spawning beds in the stream out into the deep waters of the passage on their way to the ocean.

Leaving early in the morning we took the little-known Tuxekan Passage and visited the now deserted Indian village of the same name, the former residents of which now live at Shakan. Many of the houses are still in a good state of preservation, while innumerable house and grave totems are to be seen all around. The bottom of the little bay on the shores of which the town lies, was covered with the most

bizarre specimens of sea urchin and starfishes I have ever seen, while innumerable jelly fishes were floating everywhere.

A little below the village, on a small island, a chief is buried. The grave is covered with an oblong structure, the top and sides of which are completely swathed in blankets. On the blanket covering the front a representation of a wolf is seen, this being made by sewing white pearl buttons onto the blue blanket.

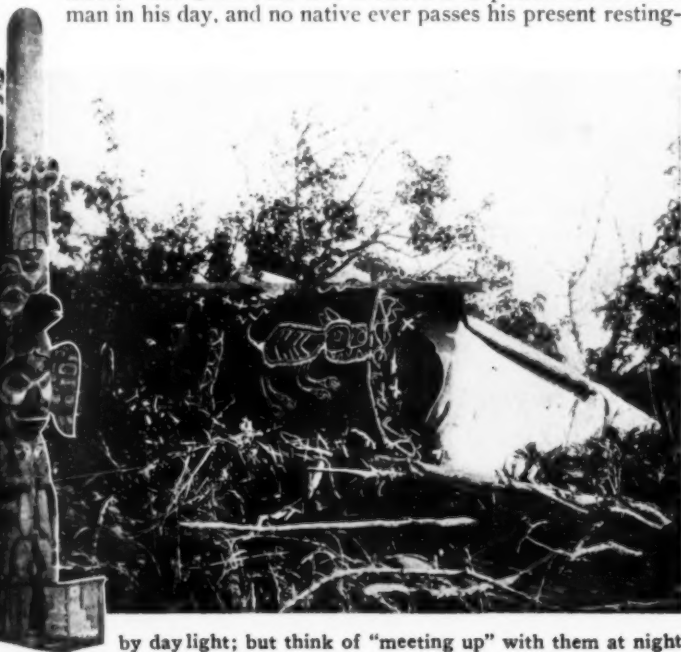
At a point several miles below is the grave of the famous Indian medicine man, Dr. Skah-owa. His grave is guarded by full-size statues of Indians, placed at each corner of the front. Dr. Skah-owa was a noted and powerful medicine man in his day, and no native ever passes his present resting-



Pieces weighing thousands of tons broke from the glacier to form icebergs.



These graves of a medicine man and a chief seem picturesque



by day light; but think of "meeting up" with them at night!



place without first invoking his favor and protection.

Shortly after leaving the doctor's grave we passed into Tonowek Bay and thence into Sea Otter Sound, a wide sheet of water. In the afternoon we reached Fish Egg Island, a thriving little settlement with a salmon freezing and mild-curing plant. We then went on to Klawak, an old Indian village, where the first salmon cannery in Alaska was built. The same company is still operating a cannery here, but the original plant burned down a few years ago. There is quite an Indian village here, and as we were sprucing up to make our social calls on the few whites, fire and smoke were seen to issue from one of the dwellings. Hurriedly rushing ashore we were in time to assist in saving part of the furniture of the doomed building.

Klawak is noted as being the only Indian village with a skating rink, a sport which the natives thoroughly enjoy.

Leaving here in the morning we continued on south through another inside passage, which at one spot, Tlevak Narrows, better known as the Skookum Chuck, contracts until one could toss a biscuit ashore from either side of the boat. They are navigable only at certain stages of the tide, owing to the strong current. At Sukkwan, a deserted Indian village, we found a few houses and totems still standing. On Hetta Inlet are several important copper operations, the most important of which are near Sulzer, and with which Congressman Sulzer, of New York, is connected. At Sulzer we found the women and children paddling and bathing in the Inlet, the unusually warm weather of the last few days having heated up the water to a point which was fairly bearable.

Thinking we could make Hunter Bay before night, we soon left Sulzer, but darkness settled down before we reached the bay, and we had considerable difficulty in finding it, almost wrecking the vessel once or twice by running into blind bays, but about midnight the lights of the salmon cannery came into sight and we thankfully tied up to the wharf and were soon sleeping the sleep of the thoroughly worn out.

Leaving early in the morning, in a few hours we were off Cape Chacon, the lower end of Prince of Wales Island, and the southerly point of Alaska, and usually one of the stormiest places in the territory, as it looks directly out to sea

through Dixon Entrance, but this morning there was nothing but a long ground swell to indicate the proximity of the ocean. We then had a long reach to the northeast, and in the afternoon arrived at the famous Indian village of Metlakatla, on Annette Island, of which Mr. Wm. Duncan is the head. There are some handsome buildings here, especially the church, which is the largest in Alaska. We reached Ketchikan, the leading town in the lower part of southeast Alaska, late in the afternoon, and tied up for the night, and those not too tired enjoyed the skating rink and the two moving picture shows of this up-to-date town.

Leaving about 8 A. M. the next morning we called in for a few minutes at Loring, where there is a large salmon cannery, and then on to Yes Bay. Passing the cannery here we continued on up to the head of the bay, tied up to the dock, and then crossed on the tramway to Yes Lake, where the launch from the salmon hatchery of the United States Bureau of Fisheries met us, and about thirty-five minutes later we were at the hatchery at the head of the lake.

In 1905, when the workmen of the Bureau arrived on the scene, this was a primitive wilderness; now handsome buildings and fine lawns greet one on all sides. About 72,000,000 salmon eggs are handled here during the fall and winter months, the resulting fry being planted during the following spring.

The next day we retraced our way to Clarence Strait, thence up the strait to and through Ernest Sound, through beautiful Zimovia Strait, past the site of old Wrangell, and reached modern Wrangell, a white and Indian town of some 350 inhabitants, about 5 P. M. This town handles large quantities of salmon each year, while the transportation of supplies and hunters from all over the world to the big game grounds of the upper Stikine River, the mouth of which is two miles away, is carried on from here.

The following morning we passed through Wrangell Narrows, stopping at Petersburg for supplies, and, bucking into a strong head wind, crossed Frederick Sound to Gambier Bay.

The last day of our trip we navigated northward through the waters of Stephens Passage, calling in at Port Snettisham, and finally reached Juneau, our starting point, having been absent nine days and having covered almost exactly one thousand miles during the cruise.

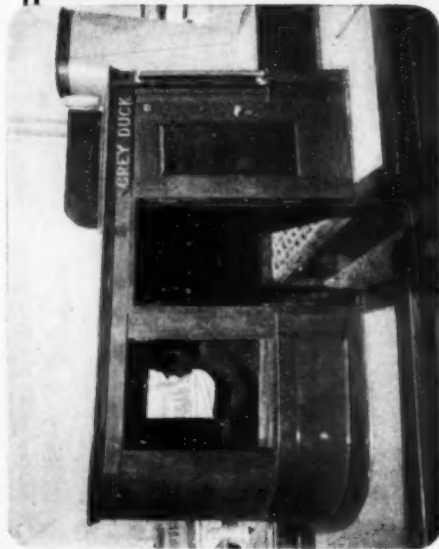


The business end of Taku glacier, the source of countless icebergs.



Frequently the Indians place their dead in little houses

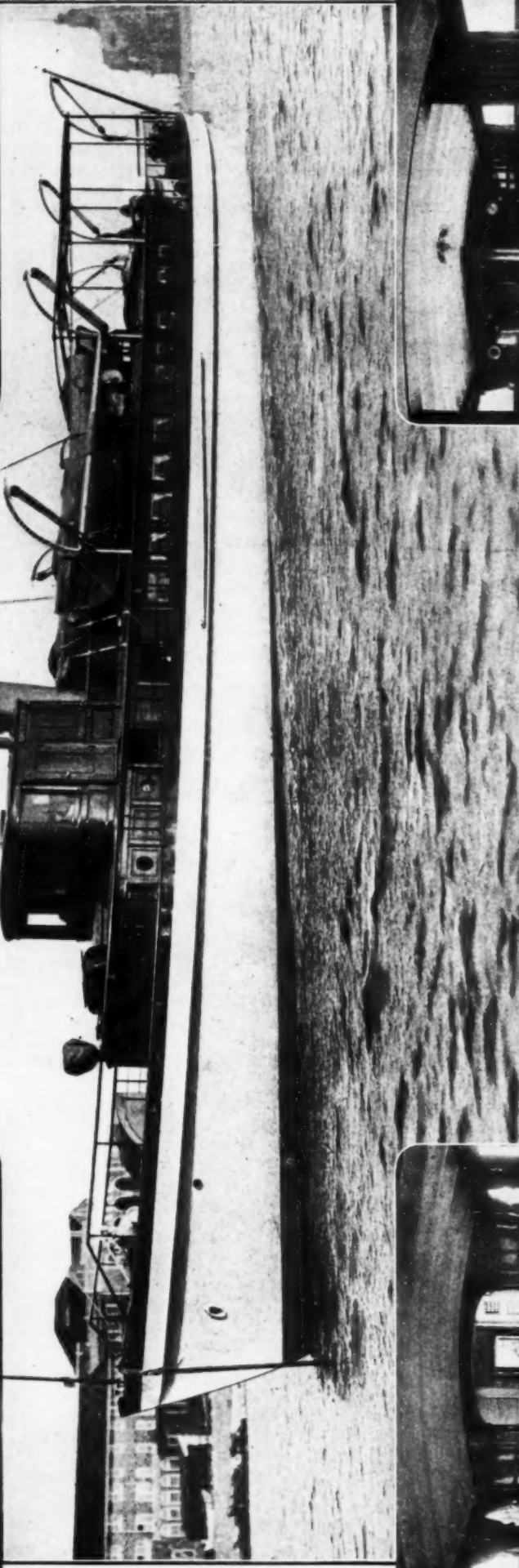
At Klin Quan, Alaska—A church in the land of the Totem.



Her pilot house actually improves her appearance.



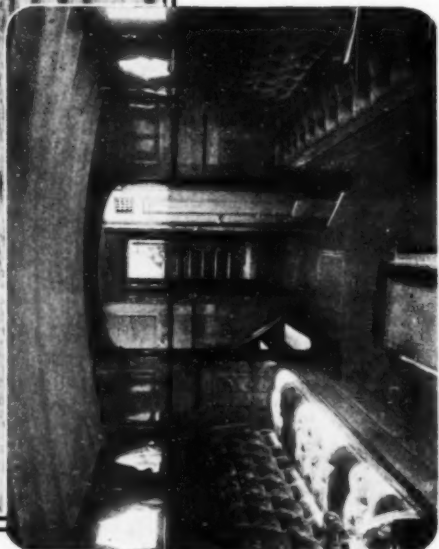
The 120 H. P. Murray and Freidrich engine.



Her long, graceful appearance is enhanced by an unbroken sheer line.

## Grey Duck — An Evolution.

Thomas L. Sturtevant's "ideal cruiser" was originally 66 ft. overall, but was lengthened to 83 ft. and generally reconstructed. Read about this interesting transformation on page 21 of this issue.

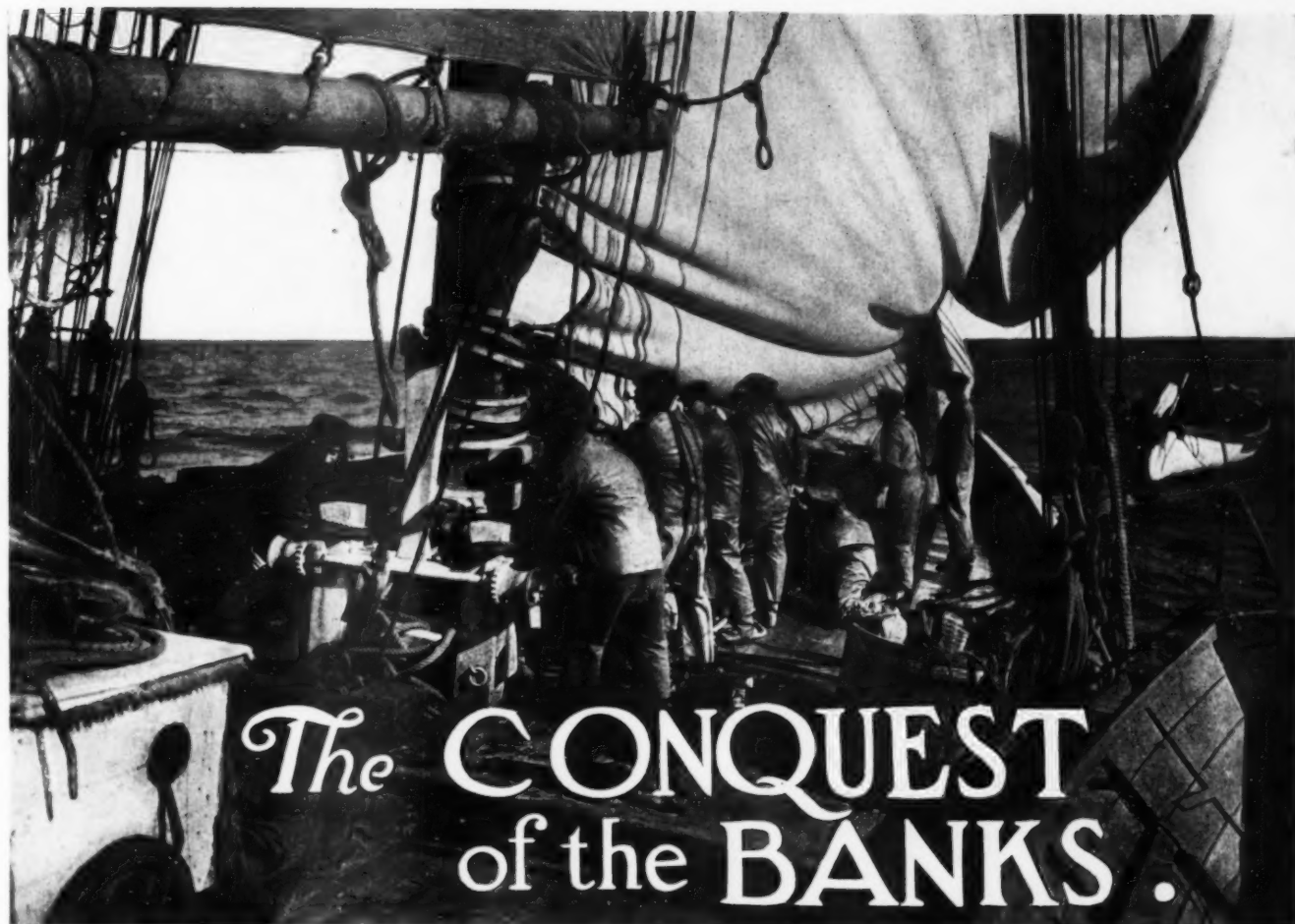


Looking aft from the main saloon.



The main saloon looking forward.





The Story of a New Role Now Being Played by the Gasoline Motor in a Picturesque Setting.

By George Story Hudson.

Photographs by Edwin Levick.

**A** LIGHT southerly breeze was fanning the Bountiful Bess from the edge of Georges Shoal toward Boston. Night, still and damp, had fallen.

The lookout lounged on the windlass. Across the breadboard the cook was savagely fighting dough with both fists. Straddling the wheelbox was the helmsman with foot against a spoke peering down into the haze of tobacco smoke in the companion.

The schooner wore all her kites—maintopmast staysail and balloon jib. She was bound to market more than 100 miles distant. The streaky air whined against her canvas as if too weak to work.

Suddenly the helmsman slipped off the box, stepped in front of the wheel and screened an ear toward the cabin. Below were a dozen other members of the crew in confab with Skipper O'Toole.

"Cripple this noble vessel with a cargo of onery junk! You're looney, man," exploded the skipper. The hood on the stovepipe winced as if the Bountiful Bess's commander had gestured against it with a red-legged boot.

"It'll cost too alfred much, ruin a year's earnin's and shoot every mother's son of us over the main-truck," the skipper went on.

A babel of protest drowned further individual remark, yet everybody appeared to be alleging that Skipper O'Toole was a foggy, a miser and measly.

A pair of lights, red and green, climbed up toward the Bountiful Bess, ranged alongside and passed

ahead. A concertina abaft the house was shrilling a sprightly jig and men were hopping to the melody. A reek of gasoline blew down into the Bountiful Bess's cabin like an invisible though quite palpable halo for Skipper O'Toole.

"Whistlin' Willie's to windward, bound nor'west," reported the helmsman. Up rose, instantly, another combat of argument inspired by the smell. Heavy fists banged bunk boards and sea boots bumped the floor.

The Bountiful Bess, it should be stated, was stowed with a valuable fare of cod and haddock—that is, the fish would fetch a lot of money if she could only reach market while demand for fresh ground fish was brisk.

Another pair of lights, eyes of red and green, ranged up from a long way astern. A faint pulsation and rhythmic swish reached the helmsman, thanks to the momentary lull in the cabin while skipper and crew caught breath for another rush at the firing line of argument.

Fishing skippers and their crews, unlike men of the merchant marine, are equals. I must not forget to state, except that the skippers receive a trifle more in wages, a larger per cent. of profits and are vested with responsibility. In this particular instance Skipper O'Toole owned the schooner and the crew were close neighbors ashore.

"Glory o' the Sea's goin' by to windward, bound nor'west," sang out the helmsman, as a dim outline slipped ahead with bowsprit pointing straight to market. More gasoline fumes drifted into the cabin. The helmsman's features contorted into a



A typical auxiliary installation; this 50-65 h.p. Standard motor takes but little room, and the removable flooring makes it instantly accessible.





"The noise of long-drawn thunder 'neath her leaping figurehead." A remarkable photograph taken from the bowsprit of the auxiliary schooner, Irene May.

grin. It was very easy to tell just how he stood on the power question.

For the crew were demanding auxiliary power. Several of the best dorymen aboard the Bountiful Bess were declaring they'd pitch their mattresses aboard a gasoliner unless the old drogger should be modernized.

"What'll it cost—how well will it pay?" ventured the skipper, now crushed by the opposition and possibility of being unable to get another likely crew to handle trawls.

An outburst of figures, records of profits earned by auxiliaries, cost of installations and remarkable runs from and to market over long ocean courses were fired at Skipper O'Toole till he retreated behind the stove and exhorted silence.

Two more motor-propelled schooners smothered by the Bountiful Bess, sails set and shaking, with motors purring deep enough to have at least 75,000 pounds of fish below.

"Harvester and Good Intent just gone 'long to windward, bound nor'west," chirped the helmsman, kicking himself in sheer delight at the way matters aboard his own haddock were shaping.

Skipper O'Toole stuck his head out of the companion, squinting at his vessel's slack canvas and threshing booms, then glanced into the binnacle and slowly bent his gaze toward the two racing auxiliaries, owned in his own town, now shadowy blurs against the stars.

The crew had closed in behind Skipper O'Toole as if to block retreat. But the skipper rolled over to the weather quarter bitts where he sat aloof.

More auxiliaries roared out of the blackness, loomed big then faded, all bound northwest with stocks representing thousands of dollars—clipping off knots like steam freighters. And the Bountiful Bess took their swash like an empty cask, rolling sluggishly with way stopped, swinging all about the compass just as if she didn't care to be found in such odoriferous company.

Satisfied to let the leven work out its own sweet way in Skipper O'Toole, the crew, now grinning and nodding complacently, grouped in bunches about the nested dories and shook hands all around. They carried the news that the skipper had been won to the cook, who quit punishing the dough and straightaway started a glorious batch of prune pie. He

ventured a guess that the Bess would log a straight six knots as he made coffee double strength to signalize victory.

Of course the Bountiful Bess didn't reach T Wharf in time to realize anything like good money for her fare. The auxiliaries had sipped all the cream, as might be expected. She had dropped about \$1,000 owing to soft winds to the auxiliaries that were forging out harbor when the Bess wallowed in by Boston light.

Wonderfully fast spread the news that Skipper O'Toole was interested in motors and was going shopping for a machine. But the skipper didn't have to leave the wharf in quest of a motor because agents swooped down on him thicker than flakes in a January blizzard. It didn't matter what sort of a motor the skipper thought he ought to purchase—the agents told him what he must have or get a rank failure that wouldn't drive the schooner a mile a week.

Skipper O'Toole perspired—was more nervous in the grasp of these agents than tongue can tell. They tied him into a knot and stretched him out till he was glad to dive into the cabin and slam the slide shut. When the motor chaps had departed he emerged from his concealment with many misgivings that he had made a big mistake in thinking of converting his schooner even to keep an expert crew.

It was decided, finally, that two 20-horsepower two-cycle motors would about fit the vessel for six or seven knots in a smooth sea. Twin screws were decided on because the deadwood bolts could thereby be spared and expense thereby lessened. Two-cycle motors were pretty much the vogue in small powers, and Skipper O'Toole was thrifty enough not to take chances with anything out of ordinary.

After the last basket of fish had been hoisted out of the Bountiful Bess she was taken to Gloucester and hauled out at a cost of about \$10 per day. Some of the crew advised standing the schooner against a wharf and doing outboard work at low tide. Not so with the skipper. That worthy was bound to have the Bountiful Bess treated with as much dignity as her advanced years deserved. Hadn't the Good Intent been hauled out when she was given her motors? What was good enough for that hooker was none too good for the Bess.

In a week's time the motors were bolted in place and the shafts had the wheels keyed and cottered. Skipper O'Toole

had been solicitous about the little rusty round stove that sat in the center of the cabin, but the heater was not disturbed though they had to remove the bulkhead and put the balance wheels of the machines through into the hold. It pained Skipper O'Toole, however, when he saw carpenters worrying a hole through the schooner's rudder and sternpost to help the propellers get a good grip. Each chip hurt the skipper as if it had been cut from his own bronzed skin.

Then came a dock trial of the motors, followed shortly by an official run of 100 miles, just to demonstrate that the motors were not likely to sulk and could be thoroughly depended on. A man from the factory tended the machines. He was positive the motors would turn the propellers 500 times a minute if contents of the 500-gallon tanks on deck was not all water instead of gasoline that had been receipted for.

Skipper O'Toole's face was a study in repressed enthusiasm when he took his stand at the wheel and reached down to the bell pulls communicating with the compartment below. The crew clustered along the rail gleeful as schoolboys.

Skipper O'Toole yanked a bell pull twice and a yeasty maelstrom boiled under the Bountiful Bess's counter. She jumped a bit as if surprised at the sudden commotion. Then she squat as if decided to rebel at the new sensation. She gathered sternway and backed out of the dock. Skipper O'Toole ported helm and pulled the bell while the crowd ashore cheered lustily.

Another foamy waste smothered up and broadened. He had pulled another bell—had both motors going, then gave the jingle. The Bountiful Bess began to throb and surge seaward, puffing wisps of steam from either quarter. She was revived—now a dividend-paying proposition, good as any of her tonnage in the fleet.

All because Skipper O'Toole had bowed to the inevitable, had rightly sized the situation when he was convinced that a schooner cannot compete with auxiliaries in the fishing industry.

Out of the 350 vessels that last year brought more than 100,000,000 pounds of fish to Boston's T wharf fully one-fourth are equipped with motors as auxiliaries. Ten years ago a motored schooner was a novelty, and the man or company investing in such an outfit was looked upon as accepting long chances. Five years ago owners declared that any vessel requiring a motor of more than 20 horsepower to develop a speed

of five miles an hour was too expensive on fuel to be of service in the fishing business.

To-day there are a score of schooners ranging around 100 tons net with motors that develop in excess of 100 horsepower and costing for machine and installation between \$3,000 and \$6,000. These motors are of the four-cycle type and are operated by an expert, usually a man who has had experience in factories where they were built till they are broken in. One of the crew is then selected for the position of engineer, and cases are rare where these pick-ups do not make good.

Advent of big steam trawlers into the New England fishery is hastening owners to equip their schooners with power. The other trawlers harvest, sometimes, 100,000 pounds of cod and haddock in a week and make regular trips. To enable the schooners to pay against such odds power is necessary and the most reliable machines of established reputation are being selected. Years ago it was "How cheap?" Now the requirement is for thorough equipment, no matter what the cost.

Mackerel seiners, swordfishermen, pollock netters and most of the vessels that work alongshore have motors and are making good. Schooners that frequent banks off the coast of Nova Scotia, set trawls on Brown's, La Have, Cashés, Western and even the Grand Banks of Newfoundland are being converted so they may make runs of perhaps 1,000 miles or more without use of sails, should occasion demand, to quickly land valuable fares.

The larger schooners carry from 1,000 to 2,000 gallons of gasoline and have contracts with refineries that lowers the price of fuel to less than 10 cents per gallon and keeps it there no matter how much the market fluctuates.

All new designs have provisions for shaft logs and foundations—every detail is incorporated in plans to make the most perfect auxiliary of her day. Performances have been carefully noted in existing hulls, so that schooners-to-be may benefit.

Already has the auxiliary demonstrated that she can save a snug penny by refusing services of tugs in docking or leaving a pier. In moderate or head winds they enter or leave harbor while the old type pays out good money for a loan of the hawser. That the installations are safe cannot be disputed because there has not been a fire or explosion worth noting since the internal combustion engine found its way into vessels of size enrolled in New England's fishing fleet.



The lee rail awash—when Boreas helps cut down the gasoline bill.



# How to Build a "Knockabout."

An All-'Round 20-Footer that Combines Many of the Advantages of Both the Dory and the V-Bottom, the Two Most Popular Types of Small Motor Boats.

By H. P. Johnson, N. A.

**I**N working up the design of this little craft, it was intended to produce a boat that would be just what its name implies: a small, staunch craft, easy of handling and as seaworthy as possible for a boat 20 ft. long to be; one that could be gotten under way with the least possible preparation, and, above all, easy and inexpensive to build and maintain.

As you will note from the lines, the model is a cross between the dory and V-bottom types, the two most popular of small craft. This combination is easier of construction than either individual type. The flat dory keel is used, which is simpler than the solid timber keel of the V-bottom, while the sides and bottom are the regular V-bottom construction. The bottom planking is put in from keel to chine, and not fore and aft, which construction eliminates the bottom framing, simplifies the planking and requires no calking.

The motor is installed way aft, which leaves a clear cockpit 9 ft. long, and since the beam of the boat is 5 ft. 6 in., it is quite roomy. The motor compartment is separated from the cockpit by a solid bulkhead and door with a sliding hatch in the deck. This hatch and door are entirely weatherproof and the motor

is really a small cabin. The motor shown is a two-cycle, developing 4 h.p. at 500 r.p.m., no reverse gear being used. This is ample power for the boat, as the model is a very easily driven one, up to about 8½ miles per hour, which is really the economical limit of speed for boats of this length, not designed for racing purposes. A motor of any power can be installed with reverse gear, if you think it necessary, which only necessitates moving the motor compartment bulkhead farther forward, and lengthening the slide. I have shown the flooring well down in the boat, of regular T. & G. stock, which would be the proper thing if the boat were equipped with a top to exclude the rain in bad weather when not in use.

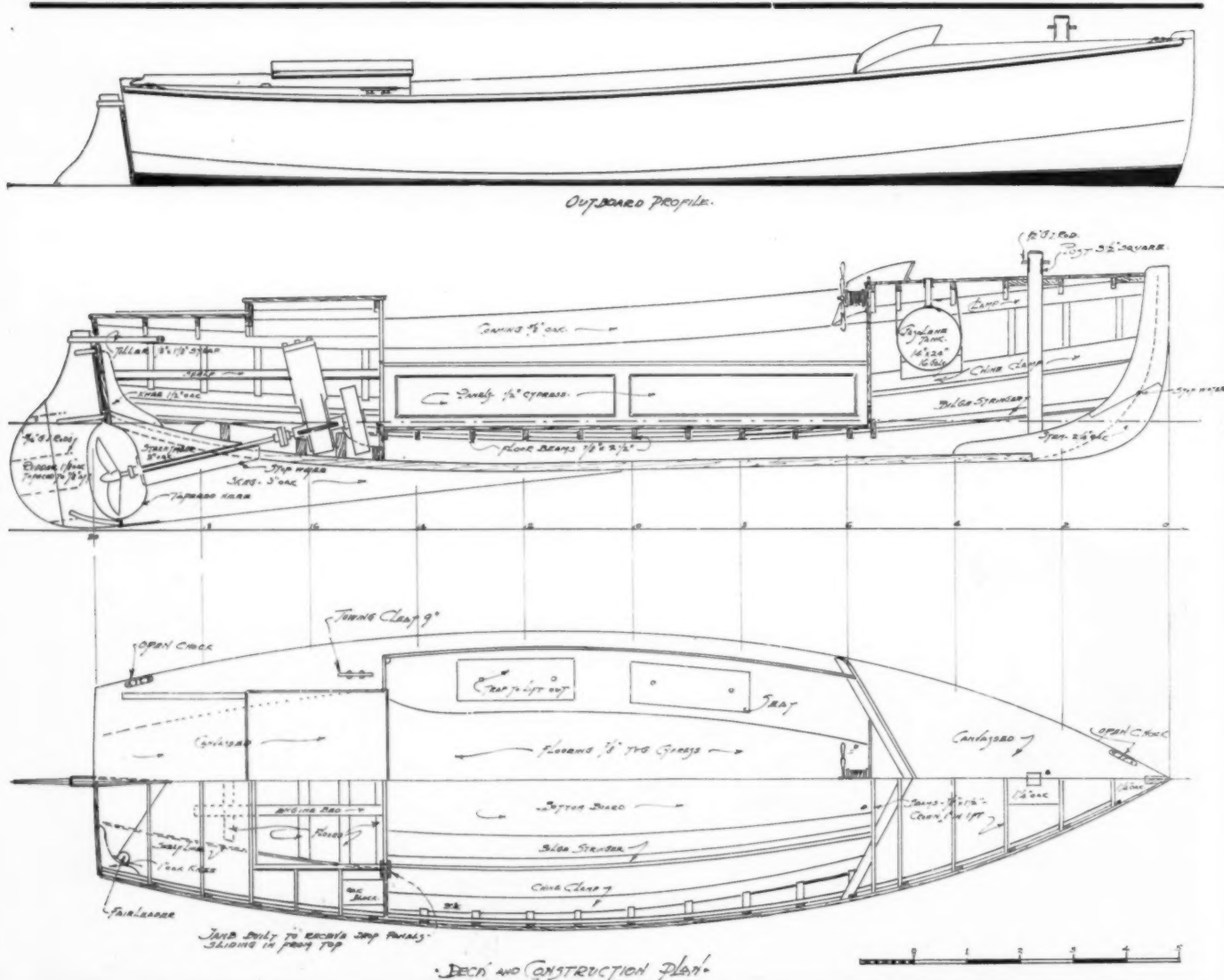
is perfectly protected in any sort of weather, and the openings are sufficiently large to allow easy access to all parts of the motor and space under the deck.

On either side of the motor are shelves and space for suitable lockers, in which can be arranged the coils, batteries, oil cans, etc., so that they can all be in a dry place under lock and key, avoiding the necessity of removing them from the boat, as is usually done in small craft when the boat is left in the weather for a few days. The space under the deck is large enough to allow of stowage of clothes, hunting boots, rods and guns, if necessary, and, in fact,

is really a small cabin. The motor shown is a two-cycle, developing 4 h.p. at 500 r.p.m., no reverse gear being used.

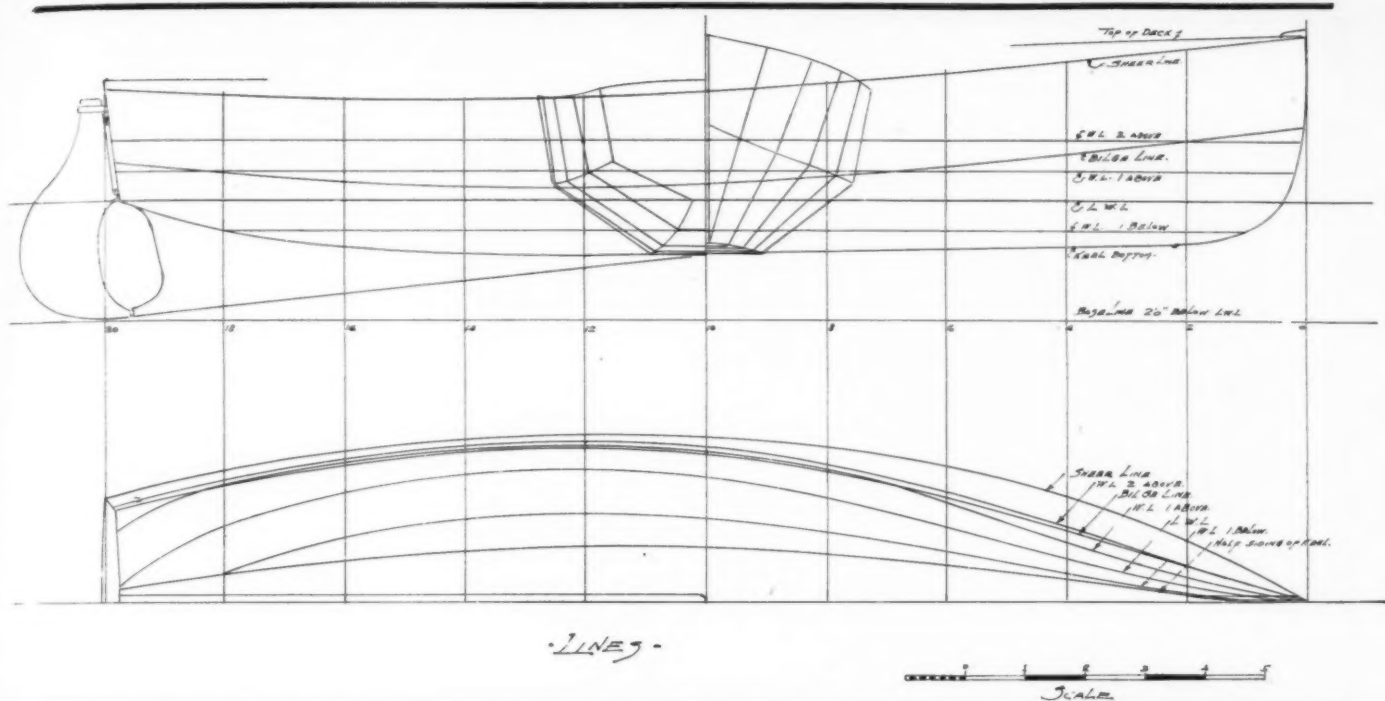
This is ample power for the boat, as the model is a very easily driven one, up to about 8½ miles per hour, which is really the economical limit of speed for boats of this length, not designed for racing purposes. A motor of any power can be installed with reverse gear, if you think it necessary, which only necessitates moving the motor compartment bulkhead farther forward, and lengthening the slide. I have shown the flooring well down in the boat, of regular T. & G. stock, which would be the proper thing if the boat were equipped with a top to exclude the rain in bad weather when not in use.

If you are not going to use a top of some kind that will keep the rain out entirely, I would suggest that the floor be raised to about three inches above the water line aft and four inches forward. The floor should then be covered with canvas, making it water-tight, fitting a lead pipe scupper through the bottom of the boat on each side, to drain off the water. On account of the floor being so near the water line, it will be necessary to



The motor, as is usual in dory practice, is installed aft under a hatch, giving a large, unobstructed cockpit amidships.





The lines of the 20-foot "knockabout" show clearly why the boat is stable, seaworthy, and easily driven at moderate speeds.

fit in each scupper a ball check, such as those used in the bottom of life boats, which will keep the water out when the boat is running and prevent her filling up if she happens to spring a leak and settle a few inches.

This floor can be made so that the whole of it can be removed in one piece, should the necessity arise. For bailing, a screw deck plate can be located in the floor, giving access to the bilge. If you go fishing, or hunting in salt water, I would suggest a water tank located under the forward deck, connected to a faucet in the cockpit, the tank having a capacity of about 20 gallons. You will find this a great convenience, saving the eternal worry about drinking water, and the cost is a trifle.

Enough for the description—we shall now get busy on the boat.

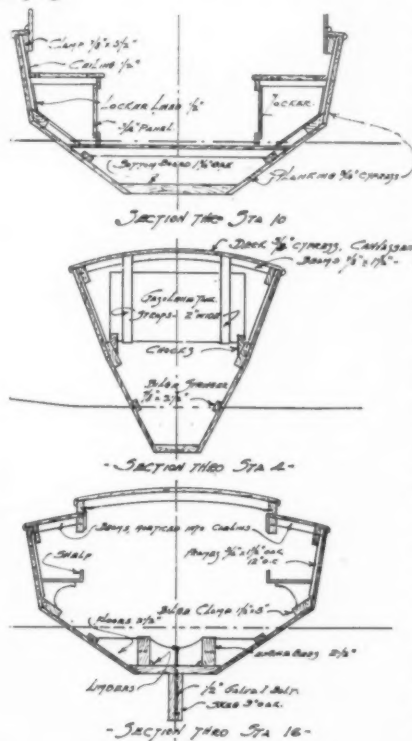
## PREPARING TO BUILD.

**Y**OU should have a tight shed of some sort, to work in, for it will more than pay in the long run. Your material should be kept dry and the finished work, if exposed to the weather before it is painted or varnished, will go to pieces in a remarkably short time, and all your pains taken in tight joints and smooth work will go for naught. And although you do not realize it in your anxiety to finish the job and get the boat going, you will want to kick yourself considerably later. In the tool line you will not need a particularly large assortment beyond an ordinary carpenter outfit, except say half a dozen 6-inch boat clamps and a chain clamp for planking. The chain clamp is used to draw the planks together, making nice tight seams, which are the chief source of worry to the amateur builder. The clamps will more than pay for themselves in the elimination of this worry. Tools, such as bits and chisels, etc., had better be bought as you need them, which will save buying a bunch of unnecessary ones. Above all, keep your tools sharp. The very best investment you can make will be in a grindstone and an oil stone, and they should be used freely. You will waste more time trying to make a dull tool work than it will take to sharpen it, and dull tools always leave their trade mark behind. A bench vise is necessary and doesn't cost much, so don't overlook it.

If you have no floor to work on, procure at least three pieces of heavy timber the length of the boat, the size or quality of which is not of much importance, so long as they can

be leveled up straight and solid, to set the moulds on. Have the foundation secure, solid and level and it will save a lot of trouble later on.

As soon as you have received your lumber from the mill, your first work will be to take the two pieces of oak intended for the chines, and fasten them at one end to the floor or ceiling or any convenient place, and prop up or bend down the other end in such a position that the pieces will take a curve similar to that when in position in the boat. They will be rather stiff at first but you can increase the bend each day so that when you are ready to put them in place they will be set and save a large amount of pulling and clamping.



The sections show the flat bottom of the dory combined with the sharp bilges of the V-bottom.

## GETTING OUT THE MOULDS.

**Y**OU can now get out the moulds. Make them of any sort of stock about  $\frac{7}{8}$  inch thick, constructing them as shown in the drawings, being careful that the center line is marked at both top and bottom, and that the corners are securely fastened so that they will not work and get out of shape. Cut the notches for the sheer and chine clamps carefully, the chine clamp notches to be  $1\frac{1}{2}$  inches deep and those for the sheer clamp  $1\frac{3}{4}$  inches deep, as the chine is  $1\frac{1}{2}$  inches thick and the planking is nailed directly to it, the top side frames being notched flush into the chine, while the sheer clamp has the frames fastened on the outside of it without notching in. The tops of moulds are carried above the sheer line, so that when they are inverted and fastened to the floor they will not need any other blocking to bring them into their proper relative position and it will be much easier to work with the boat upside down than the other way. The transom is to be made of  $\frac{7}{8}$ -inch oak, which you will probably have to get in two pieces and fasten together with 1-inch x 2-inch oak strips screwed on the inside. A mahogany transom will look better and you will be able to get this in a single width without trouble and the difference *is* in cost is hardly worth considering.

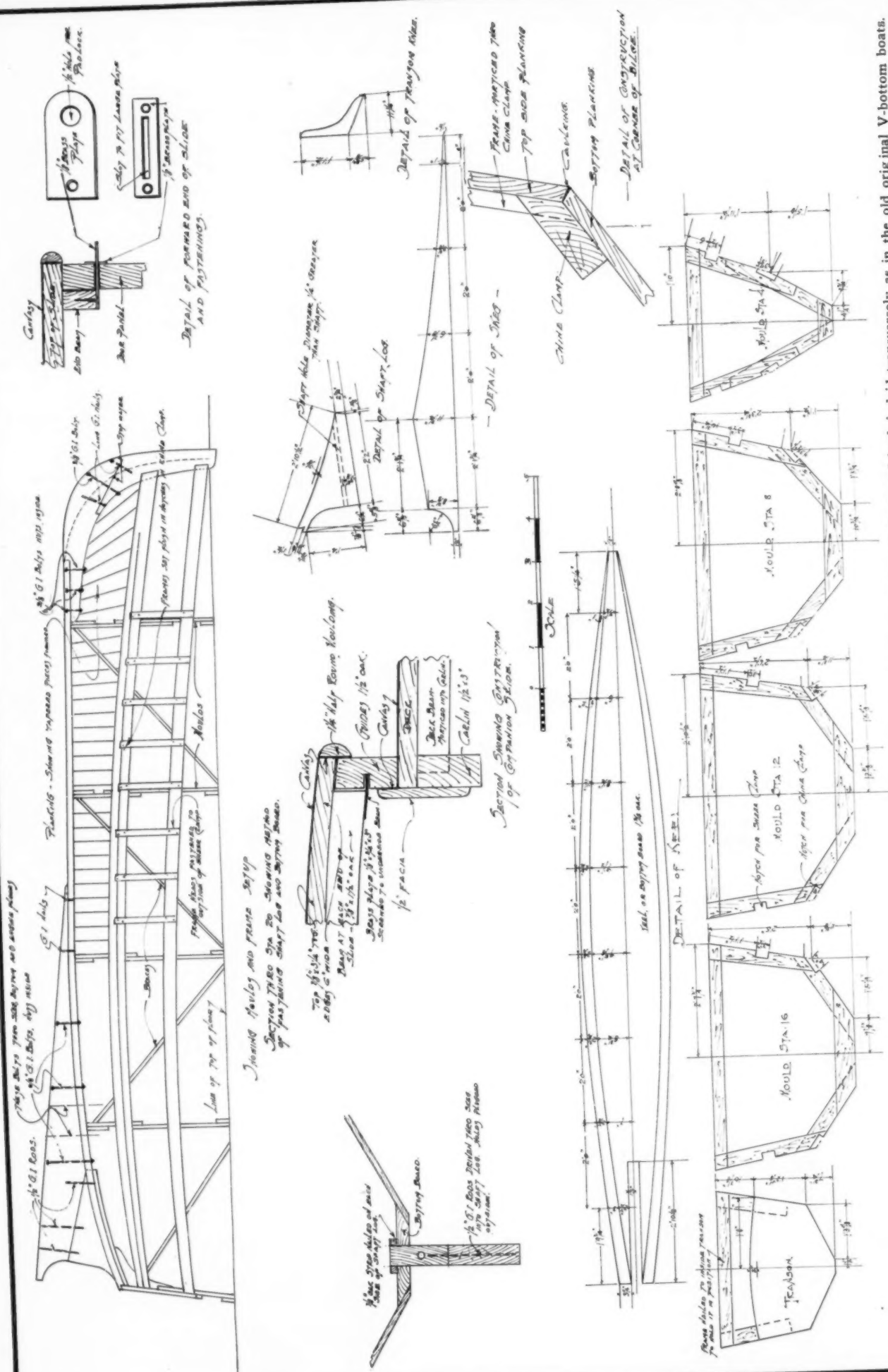
The frame shown on the top of the transom is only a temporary arrangement to hold it in position when setting up.

After the moulds are made you can turn your attention to the keel plank or bottom board. This should be of oak, elm or mahogany and will save some work if it can be gotten in a single width.

This is hardly possible in oak or elm, so if these woods are used, it will have to be made of two pieces with a seam down the center and fastened together with cleats, securely fastened across the inside about 18 inches on centers. The figures on the drawings give the exact widths on the inside and outside so that the bevel is very easy to cut. The slot in the aft end is to receive the shaft log where it goes through the keel.

The stem is to be made of oak  $2\frac{1}{4}$  inches thick, scarphed as shown. If you are lucky enough to run across a hackmatack knee which will allow the proper curve, of course, it will be so much the better. If you can have a mill man saw out your stem on the band saw, it will save a lot of hard work and he can make a nice, clean cut of the scarph.

Fasten the stem together with the bolt and



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Fig. 1

You'd STA. 16

ing the 20-foot "knockabout." Note

1

1

nails, as shown, being careful to bore for all the fastenings, so that they will drive true and not split anything.

The holes should be bored with a bit about 1/16 inch smaller in diameter than the fastenings. Mark on each side of the stem the rabbet line shown. This line is the intersection of the face of the stem and the face of the planking and a rabbet will have to be cut in the stem beginning at this line, to receive the planking. Do not attempt to cut this rabbet now, for unless you know the game, you will make a fizzle of it. The skeg and shaft log are to be worked out of a 3-inch oak plank to the dimensions shown, and the edges nicely smoothed. In smoothing or "jointing" up the edges use a small try square often, to make sure that the edges are perfectly square and flat. If the edges are rounded or are not square, the fastenings cannot hold the pieces together as securely as they should, as it allows the rods or bolts to bend in cases of heavy strain.

The shaft log is to be bored, but before marking the hole, you had better decide what motor you are going to use, as the dimensions of the motor will decide its exact location, which may change the angle of the shaft. After you have decided just how your shaft line is to run, procure a ship auger of a diameter 1/4 inch larger than your shaft. Get a bit without a tip on the end, as you can drive this type straight, whereas the bit with a tip will not drive straight if the grain of the wood happens to be crooked. It will catch in the grain and follow it out the side. Make a mark on each side of the shaft log, showing the center line of the shaft and mark the center of the hole on each end of the wood.

Tack a straight strip of wood on one side along the center line of the shaft and screw the whole outfit up in the vise. In boring the hole, the wood strip will show exactly whether you are boring straight sideways and an assistant stationed on the side can tell, by watching the wood strip and the bit, whether you are boring straight as far as elevation is concerned. By boring from each end and exercising a little care, you will have no trouble making the holes meet exactly in the center.

Cut out the transom knee of 1 1/2-inch oak and you are now ready to set up the frame.

#### SETTING UP THE FRAME.

**P**LACE the moulds on the floor, or foundation timbers, first snapping a center line and marking off lines at right angles to it, exactly four feet apart, making sure that all are perfectly square.

Now set up the moulds, fastening them securely in place, perfectly plumb, and brace them as shown. The moulds Nos. 4 and 8 are to be set so that their forward edges are on the station lines and the moulds 12 and 16 so that the aft edges are on the lines. The stem and keel plank can now be bolted together and placed in position, taking care that the top of the stem is very securely fastened onto the foundation or floor.

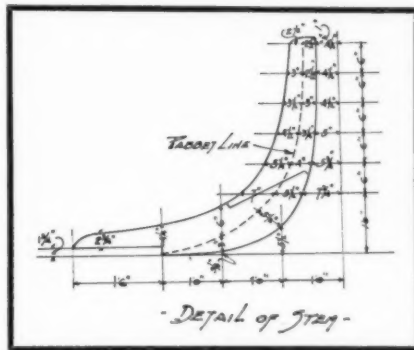
The keel can now be bent down over the moulds, taking care that its center line coincides with the center line in the moulds.

The aft end can be held down by braces from the roof, while the shaft log is inserted and fastened. The shaft log slips through the slot cut in the aft end of the keel plank and the keel plank is fastened to it and a 7/8-inch strip of oak nailed on each side along the top of the shaft log, as shown in the sketch. The transom knee is then fitted in, fastening to shaft log with long, galvanized nails and to the transom with brass screws. These screw holes should be counterbored to a depth of about 3/4 inch with a 1/4-inch bit, and plugged after the screws are driven.

The skeg is now fastened in, bolted to the keel plank and galvanized rods driven into the shaft log. If the keel plank is made of two pieces the bolts should be "staggered" or placed alternately off the center line.

We can now bend in the sheer clamps. These are to be of yellow pine, 3/4 inch x 3/2

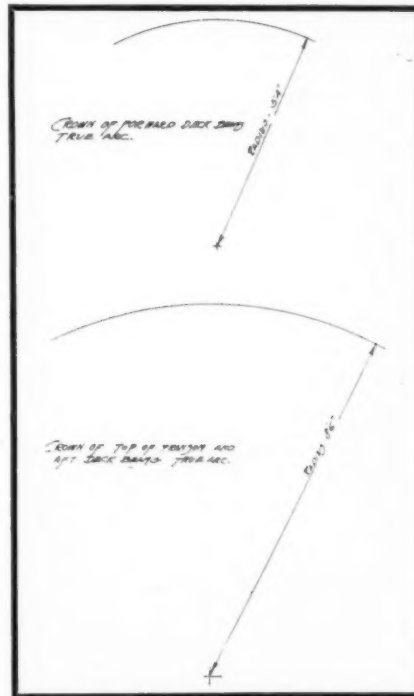
inch, fastened to the transom by a 7/8-inch oak knee, tacked to each mould, and fastened to the stem 1/2 inch below the line of top of deck. Before putting in the chine clamp, it would be well to bevel it, as it will then bend easier. The bevels can be taken from the notches cut in the moulds and the clamp cut



Offsets for laying out the stem.

roughly to correspond, to be finished after it is in place. Fasten it securely to the transom, and backing it to each mould secure it to the stem, beveling the end so that the forward edge strikes the stem about 2 inches aft of the rabbet line. The chine clamp can now be planed up smooth on the beveled side, to the exact angle of the sides.

Now mark off on the chine and sheer clamp the spaces where the frames are to go and commencing at the center cut the notches, which are simply two saw cuts 3/4 inch deep, chiseled out between. Make these notches a neat, clean fit, so that the frames set snugly into them. These frames are to be of oak 3/4 inch x 1 1/2 inches. As they go forward they will not be mortised entirely through the chine; setting them in about 2 to 2 1/2 inches will be sufficient.



The deck beams are true arcs and but one radius is used for all the beams of each deck.

Fasten them with two galvanized wire nails into each clamp, and cut off the lower ends, flush with the lower side of the chine. You are now ready to commence planking.

#### PLANKING.

**T**HIS material is to be cypress or cedar. 3/4 inch thick, and for the top sides you can procure the material in single lengths. Divide the space between the corner of the

chine and the top of the sheer clamp into four spaces, marking at each of the moulds, stem and transom. Make these marks on the frames, so that they can be seen from the inside of the boat.

You can now cut the rabbet in the stem, but only enough for the first plank.

Take a batten about 2 inches wide, same thickness as the planking, long enough to touch the two forward moulds and tack it to them, cutting off the forward end at the rabbet line, making a square end. With a chisel, cut the rabbet to fit this piece in flush as it bends around the moulds, taking care that it lies flat against the stem the full width of the rabbet, and that the ends are square; otherwise you will always have a leaky joint here.

Cutting a few inches will give you the knack of the thing, but don't cut the rabbet without the batten, as the angle is constantly changing and requires attention all the time. Select a board from your stock and cutting it roughly to fit the rabbet, clamp it in place along the chine, for the first plank. You can then run a pencil along the corner of the chine, marking the lower edge and marks made to correspond to those on the frames, for the upper edge. Take off this board, and with a batten run a line through the marks showing the top edge of the plank and cut it out.

The lower edge will have to be beveled so as to make a miter joint, as shown in the sketch, so you will have to take the angle of this bevel with a bevel square at each mould. Plane the lower edge to this bevel and in finishing the top edge, give it a slight bevel so that the seam will be slightly open at the outside and tight inside. Lay this finished plank on another board and cut another exactly like it for the opposite side. You can now clamp it in place and cut the forward end so as accurately to fit the rabbet in the stem.

Now you can fasten it, starting at the stem, with galvanized wire nails or brass screws if you prefer, although the nails will make a good job and are easier to put in and buy. Put only two nails into each frame about half an inch from the edge of the plank. These nails should be just long enough to project through the frames about a quarter of an inch after they have been punched. The points are then turned over or clinched. Drive about two nails between the frames, through the planking into the chine clamp, about half an inch from the edge of the plank. These nails need not be clinched. In getting out the next two strakes, tack a batten 3/4 inch x 2 inches, the lower edge along the marks showing the line of the top of next plank, then lay on a board, outside the plank now in, and the batten. You can then run a pencil along the edges of the plank in place, and the batten, and you have your plank marked out. Saw it out and plane it up, allowing a slight bevel, as in the preceding one. Before fastening get your chain clamps into action, drawing the planks together as close as you possibly can, making sure that the seam is tight inside and open outside and not vice versa. You can't get them too close, as the seams will always open slightly before you commence calking.

#### THE BOTTOM PLANKING.

**T**HE bottom planking comes next. This is to be put on from keel to chine and not fore and aft, and you can order this material in boards 4 inches wide and have them dressed on the edges also. This will make square, true edges and save some work. Begin amidships and work aft first. Cut the ends off so that they fit the angle of the top side planking, allowing a small opening on the outside for caulking. Fasten each plank to the chine with two nails near the end, and another in the center farther in. Don't drive too many nails, as this is as bad as not enough, for they split up both the plank and chine and, of course, cannot hold. The planks lap over the beveled edge of the keel plank and are nailed to it, cutting the end off roughly, to the angle of the keel.



Continue the planking in this manner to the transom. As you proceed with the planking forward, about at station 6, you can begin tapering each one a little, as shown in the drawing, so that they slant aft from the chine to bottom, as they will each have a little twist, as they near the stem. Before you fit the last plank to the stem, where the scaph crosses it, bore a  $\frac{3}{4}$ -inch hole right through the joint, at the deepest point of the rabbet and drive through it a piece of thoroughly dry pine or cypress, chiseling the ends off flush with the surface of the rabbet. This plug or stop water, as it's called, will stop any water that might otherwise leak in through the seam in the stem.

The last plank can now be fitted into the rabbet. If you have been careful in drawing the bottom boards up tight together they will require no caulking when they join, except possibly for a few feet near the stem, where it will be advisable, as they are out of the water nearly all the time.

The boards can now be cut off flush with the batten and smoothed up.

#### THE DECK BEAMS.

**T**HE whole outfit can now be lifted from the floor and turned right side up, leaving the moulds in place while the deck beams are fitted. These are to be made of cypress or spruce,  $\frac{3}{4}$  inch x  $1\frac{1}{2}$  inches, cut to crown, as shown, all beams forward being cut to the same radius, as are also the aft beams.

Notches one inch deep are cut into the clamps and the beams notched, so that they fit securely, the top of the beams being flush with the planking and clamps, securely nailing to clamps and planking. Fit the reinforcing block between the beams to receive the bit and the breast hook, fastening it to stem, clamps, beam and planking. The deck beams aft and framing around the companionway can be fitted, removing the moulds as you proceed. Tack a couple of strips across amidship, to keep the hull from springing and you can then remove all the moulds, putting in the bilge stringers, fastening them with two nails through each plank. This stringer should be run half way between the chine and keel plank.

#### THE ENGINE BED.

**T**HE engine bed can now be fitted. These members are to be of oak or yellow pine,  $2\frac{1}{2}$  inches in thickness. Fit the cross floors carefully, so that they bear evenly on the keel plank and planking. The fore and aft pieces are to be halved into the floors so that they fit down to the keel plank nice and snug. Make all these joints a nice, tight fit and you won't be worried with excessive vibration. Each of the heavy floors should be bolted through the keel and skeg and fastened to the keel and planking with the long galvanized nails.

The top of the bed timbers are to be lined up to the line of a string, run through the center of the shaft hole, of course, allowing the difference between the center line of the crank shaft and the underside of the bed plate.

Now you had better put in any shelves or lockers in the engine compartment that you think necessary, as it will be much easier now than after the deck is in place.

#### THE DECK.

**T**HE deck is of  $\frac{3}{4}$ -inch cypress or pine boards, about 5 or 6 inches wide, placed fore and aft. After the nails have been punched and all uneven spots planed off, cover the deck with a layer of black waterproofing building paper, laying it edge to edge and tacking only where turned down over the sides, sufficiently to hold it in place while the canvas is being put on.

The canvas is to be of 8-oz. duck, and can be either put on in a single width or with a seam down the center. I would advise laying this perfectly dry, although a number of other good methods will be found in the Contest Department of this issue. Stretch as tightly as you can, fore and aft, and tack with  $\frac{1}{2}$ -inch copper tacks; then stretch thwart-

ship and tack only along the edges so that the sheer mould will cover the tack heads. As soon as stretched, give the canvas a good coat of paint, otherwise the moisture may get to it and wrinkle it up when it dries. The coaming can then be put in. This is to be of  $\frac{3}{4}$ -inch oak and is brought to a point forward, flaring slightly. The heads for the fastenings should be counterbored for and plugged, as the coaming is to be finished bright.

In order to make a tight job around the coaming, the canvas should be turned up on the outside and tacked to the coaming close to the deck, with plenty of thick paint between, spacing the tacks about  $\frac{3}{4}$ -inch apart and covering the joint with a piece of quarter-round moulding.

#### THE COMPANION SLIDE.

**T**HE companion slide can now be made, as shown in the construction section. The guides are to be made of oak with the slot cut in to receive the brass plates on the underside of the slide beams. If you have no plane to cut this slot, simply take a nail and drive it through a piece of hard wood, filing it to a chisel point, projecting to a depth of  $\frac{1}{2}$  inch. A small wood strip nailed across at the proper distance to act as a guide completes the tool. The slot is cut by simply forcing the nail along the wood, scraper style, until it has cut itself to the proper depth. The guide should be tapered a little lower at the aft end and end in an O. G.

In fitting the cross piece between the guides at the aft end of the companion opening, mortise it into the guides to a depth greater than the slide grooves, and fit it neatly, in order to keep out the water that will follow the grooves and get inside. This is where nearly all companion slides leak. The guides are to be placed on top of the deck and securely fastened, the canvas being turned up inside the opening and tacked to the guides and cross piece with thick paint between.

If you are careful you will not have to cut the canvas at this point to make it absolutely tight. The edges of the canvas are covered by a  $\frac{1}{2}$ -inch facing strip.

The slide beams are to be of  $\frac{3}{4}$ -inch oak, with a crown a little greater than the deck, the aft one being deep enough to fit as close as possible to the deck without scraping.

The top is covered with tongue and grooved stuff, the edge pieces about 6 inches wide, as they are likely to split off if wider. The canvas is laid on the same as for the deck, covered by the moulding on the sides, which should be about  $1\frac{1}{4}$  inch wide in order to prevent any water blowing in. The brass plate at the forward end are screwed in place after the slide is in position. The slide is secured by a piece of brass shown in the sketch, screwed to the underside of the slide beam, projecting through the door panel, a padlock being snapped through the hole in the end. This locks both the top and door at the same time.

#### BULKHEAD AND FLOOR.

**T**HE bulkhead can be built of  $\frac{3}{8}$  inch x  $\frac{3}{4}$ -inch tongued and grooved stuff, building the door jamb with a 3-inch strip on each side of the ceiling, forming a rabbet, into which the doors drop. The sill should be a couple of inches above the cockpit floor. The doors may be two plain boards faced on the edges to prevent warping and rabbeted where they join, and fitted so that they drop into the rabbet in the jamb and slide down into place. A better scheme is to have these panels made at a mill, with a number of slats, or louvres in the center to insure ventilation to the motor compartment.

The flooring is laid on beams resting on the bilge stringers and should have a loose board or two in the center. If you wish to make the cockpit watertight, the floor is raised about four inches higher than shown, amidships and 5 inches forward. The flooring in this case should be of T. & G. material and arranged so that the whole of it can be taken out in one piece in case of an emergency. This floor should be canvassed like the deck, the canvas

being turned up about four inches all around the edges. The scuppers will be of lead pipe one inch in diameter, with a ball check life boat bailer soldered to the pipe just at the floor.

The seats and lockers can be arranged as your fancy dictates, and the bit placed through the deck and mortised into the stem.

#### FUEL TANK.

**T**HE gasoline tank is of the galvanized seamless steel kind, hung to the deck with a couple of iron straps and chocked in place to the chine clamp.

The filler pipe leads through the deck, screwing into a brass deck plate, so that any spilled gasoline will go on the deck and not into the hull. Before screwing on the deck plate to the filler pipe, file a couple of deep nicks into the pipe threads, to vent the tank.

The gasoline supply pipe should be a  $\frac{1}{4}$ -inch flexible copper tube, and should lead around the sides of the boat just under the coaming. By no means place it in the bilge where a leak is most likely to start something that will be hard to stop.

#### THE RUDDER AND TILLER.

**T**HE rudder can now be made, as the drawings show, of oak  $\frac{3}{8}$  inch thick, tapered and rounded at the aft edge;  $5/16$ -inch galvanized rods driven through from the aft edge will hold it together. It should be hung on regular rudder gudgeons, but the two lower irons which fit on the rudder should have a piece of iron welded to each side in order to sufficiently strengthen the wood, as otherwise it will be very likely to split off if the rudder is turned hard over while the boat is backing. There are to be eyes in both the rudder and transom, the lower eye on the transom being above the eye in the rudder and the upper eye, below the eye in the rudder. A galvanized rod is run through the eyes, and it will be impossible for the rudder to be accidentally unshipped.

The tiller is a galvanized band  $\frac{1}{8}$  inch x  $1\frac{1}{8}$  inch, bent around the top of the rudder and riveted together in three places inside the boat. Two bolts through the tiller and rudder head will hold it in place, and a couple of holes drilled in the forward end take the steering lines. These lines are to be lead through a galvanized fair leader on each side and forward to the wheel. See that you have a sufficient number of turns of rope on the wheel drum, to allow the rudder being swung hard over from side to side, and then tack the line to the drum in the center.

Place a block under the deck to stop the tiller, so that it only swings over about  $50^\circ$ .

This is all you'll need and a greater angle will put too much strain on the gear in backing up.

#### CAULKING AND FINISHING.

**C**AULKING and finishing up is next on the program. It is best to have this stunt until last, as newly-worked wood always shrinks a little and very often your material is not the very driest stock and it is better for the caulking to allow all the shrinking before hand. Your seams should all be small, so a caulking iron with a very thin edge should be gotten, along with a bunch of "lamp wicking." This is caulking cotton rolled into loose cords, and you can use as many cords as the seam requires.

This caulking job requires quite a knack to do it properly. Don't use anything heavier for hammering than a wooden mallet, as it is not desirable to drive the cotton too hard. It is first driven into the seam a little at a time, looping the cotton back slightly so that it will not be stretched too tightly, but not enough to make it lumpy in the seam. If the seam enlarges a little, you can loop it back a little more, so that it drives in with a uniform pressure, as that is one of the big points in the game, keeping the mass as uniform as possible. The cotton should be driven so that it is about  $\frac{1}{8}$  inch below the surface, to allow for the putty. It will not be necessary to caulk the cross planking on the bottom, as the

(Continued on page 80.)



# The COMING of THE HOUSEBOAT

By John Trumphy.

**T**HE up-to-date houseboat is really a sensible cruising motorboat or yacht and has to meet most of the requirements of the latter, and at the same time give the owners the comforts of home. To overcome the crowded accommodations, unhandy access and lack of light and air, which are found on many motor boats, when provision has to be made for staterooms, saloon, galley, crew's quarters, stores and motive power (without getting into too large a boat) and give home comfort combined with speed, sea-going qualities, and in most cases shallow draught are the conditions which have to be fulfilled by an up-to-date houseboat.

It is a common idea, even now, that Florida is the one place in America fitted for ideal houseboat life, and along the Indian River and the beautiful Lake Worth there has probably been congregated a more goodly number of houseboats than at any other point in this country. Yet Florida is merely the winter home of the houseboater. If his boat is rightly planned, he will find within easy running distance of most of the leading cities of the country, beautiful streams and bays where he may anchor among the finest scenery, and may be within easy reach of his business when occasion requires.

A New York business man who wants all the advantages that a yachting trip would bring, yet finds it necessary to keep in close touch with his business, can anchor his houseboat every night among new and beautiful scenery, yet always be within easy running distance of the city. He can go into many beautiful bays and winding inland streams

where the yacht could not hope to venture; along the Sound, Great South Bay, Gardner's Bay, New Haven Harbor and New London, all within easy reach. In more venturesome mood, he can visit Martha's Vineyard, Cottage City and Buzzard's Bay.

Along the Harlem and East Rivers and the west bank of the Hudson, under the Palisades, are points well adapted for anchorage; while along the Jersey shore and the Staten Island shore are beautiful nooks never seen, though a man live a lifetime in Manhattan, unless he spends a summer around the harbor on his houseboat. Certainly no city in the world, even including London with its famous Thames, affords such changing scenery and such manifest advantages for a cool, restful life during the heated season.

The conditions around New York are, in a measure, duplicated around Philadelphia; around Boston; around Baltimore; along the beautiful Chesapeake Bay, with its many streams and forks; along the lake front of Chicago; of Cleveland; of Buffalo; along the respective rivers which front Pittsburgh, Cincinnati, St. Louis and the various Mississippi River towns down to New Orleans. In San Francisco, sheltered by Belvidere Island, the inhabitants of the so-called arks or primitive houseboats have been spending long, cool summers of pleasure.

The leading pleasure resorts are so numerous along the coast, bays or the inland streams, that with the proper sort of a houseboat there is practically none of them, from inland Florida in winter to the Thousand Islands in summer, that is inaccessible.

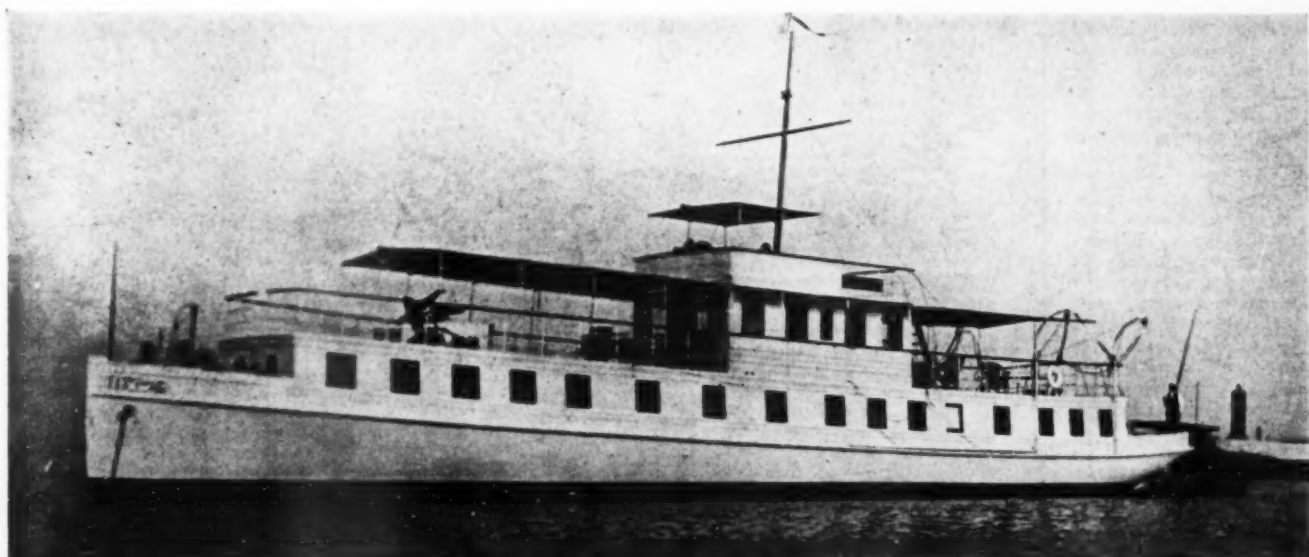
Except for the palatial yachts of large size,

women are very seldom at comfort in any other type of boat than the houseboat. There is an air of home, a domestic spirit, room enough and comfort enough about a houseboat to appeal to the wife as well as to the husband, to afford an ideal summer home for an entire family, amid healthful, stimulating influences of natural surroundings that shift as constantly as a panorama, while the houseboat goes from place to place.

But it all depends upon having the right kind of a houseboat, and here again the size of boat is the first question to consider. Boats 60 to 80 feet long, 16 to 18 feet in width, and draught 24 to 36 inches seem to be the sizes that will meet the ordinary requirements and make the best all-around boats.

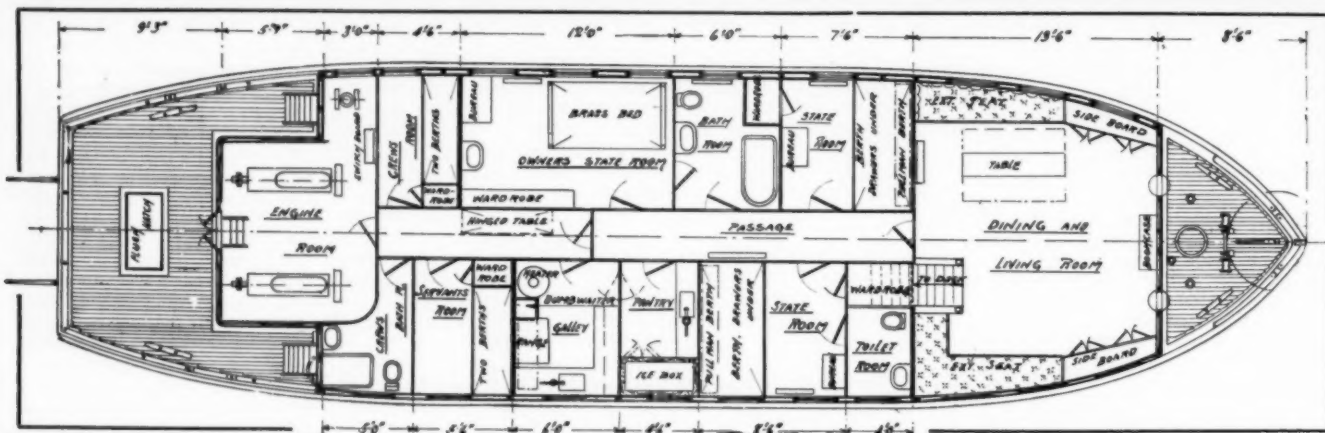
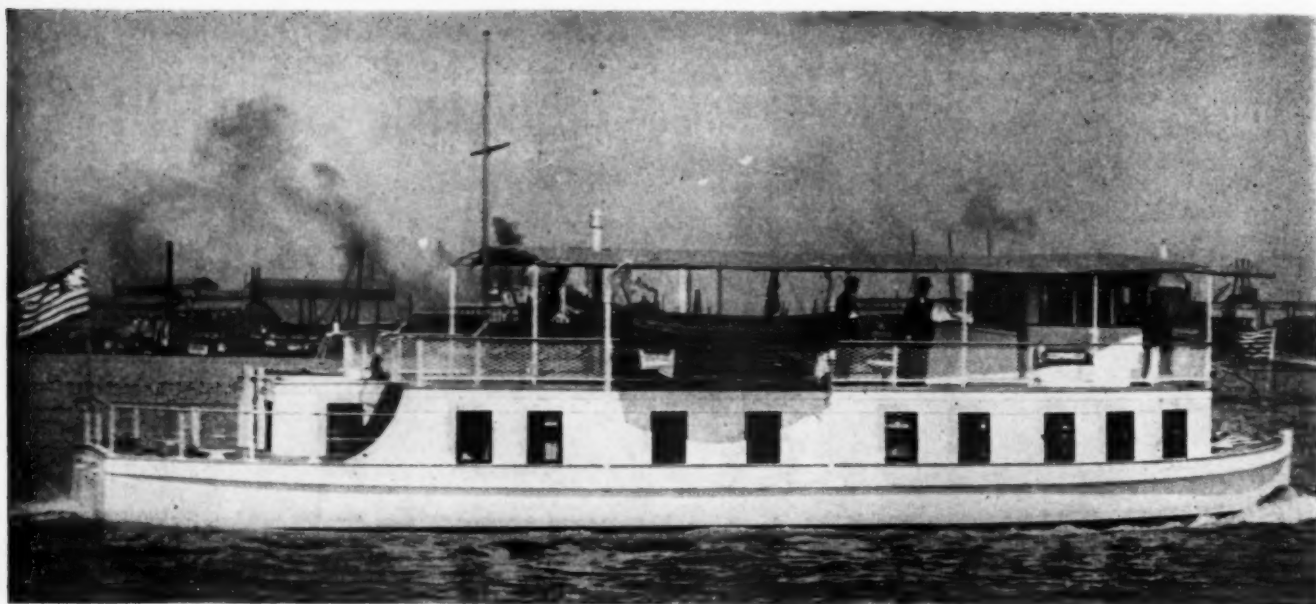
Boats for special Florida use, such as the houseboat Cocopomelo, which is 70 ft. by 18 ft. 6 in. with a draught of only 18 inches, allow a very full forebody and this gives ample room forward as shown in cut. In a boat of this type with a very full forebody, it is advisable to cut the upper deck forward, as her extreme fullness would be still more noticeable with the upper deck carried forward. This boat has not been out of commission since built, and has been used both North and South with great comfort to the owner. Picking the weather, this boat can make the trips outside without danger.

Some writers have preferred to call Ednada III a "yacht houseboat" because it thoroughly combines the desirable features of the houseboat with the best features of the cruiser. What's in a name? It is what Ednada III offers in the way of comfort, of speed and ability to ascend inland rivers and to skirt the coast that is its real attraction. If you have been working under the impression that the houseboat is limited in its cruising radius, consider for a moment the trip which the owner took on this boat during last summer



The 110-foot power houseboat, Osiris, designed by Morgan Barney. Note the capable hull, large deck space, numerous windows and pleasing appearance of the boat as a whole.





Cocopomelo is a 70-foot Mathis houseboat of the shallow, tunnel stern type, with a draft of but 18 inches. She is an ideal boat for inland cruising and, with her pair of 25 h.p. motors, makes a speed of about 10 miles an hour.

season that is just past.

Starting from Camden, he went down the Delaware, out into Delaware Bay, along the Atlantic Coast, up to New York Harbor, up the Hudson to Albany, across the Champlain canal to Canada, along the St. Lawrence, touching at Toronto, down into Lake Erie, and returned by the Erie Canal after ranging around Lake Champlain for a while.

In this one cruise alone, it met with conditions that no ordinary yacht could successfully cope with. First, it proved seaworthy along the coast. Second, it could ascend rivers that no yacht of the same size could ascend. Third, it was possible for it to get under the bridges along the Erie Canal because of its compact, low construction. Yet in spite of that compactness, there is more head room in the living quarters below deck than in most yachts of larger size. Window shutters with ports and freeboard had been provided, but it was not found necessary to take these shutters out of the boxes even in bad weather. The type of Pullman windows which were first introduced in boat building on Cocopomelo insure watertightness, greater rigidity to the window frames and more ventilation in rainy weather, provided the up-

per sash of the window is made to drop.

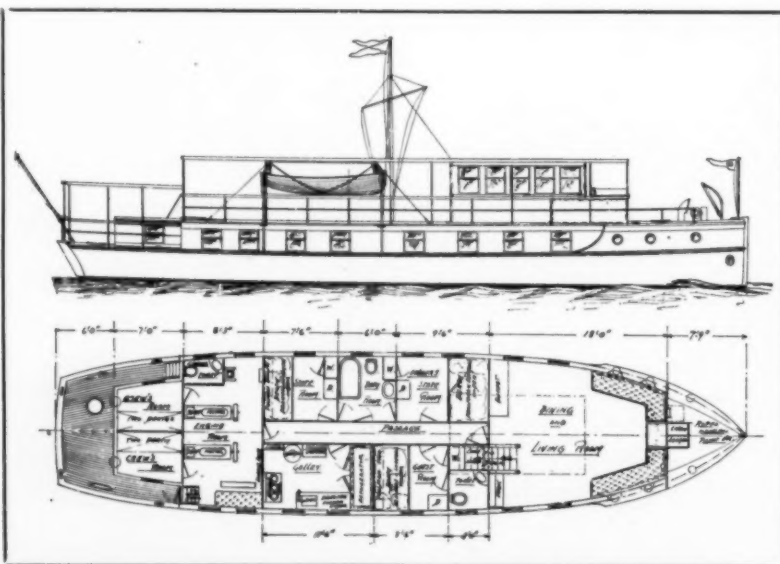
You ask whether it is possible to produce a boat with the characteristics and yachty lines of Ednada in 65- or 70-foot length. Yes, with a proportionate reduction of beam and a consequent reduction in width of staterooms, or a rearrangement of same. But it is natural to expect that a 65-foot boat will not contain as many staterooms, if the same commodious proportions which exist in the Ednada are retained.

A happy mean can be arrived at, which will make a boat suitable for both South and North, such as Lunaria or Lodona. Lodona is 77 ft. by 18 ft. 6 in. with 30-inch draught, and the Lunaria is 70 ft. by 16 ft. 6 in. with 27-inch draught. The latter is given a beam to suit the canals to the Great Lakes, and the deck-house is made in halves for height of bridges. This is a very attractive, clean-cut boat, fined up forward just sufficient for a good run and at the same time considering

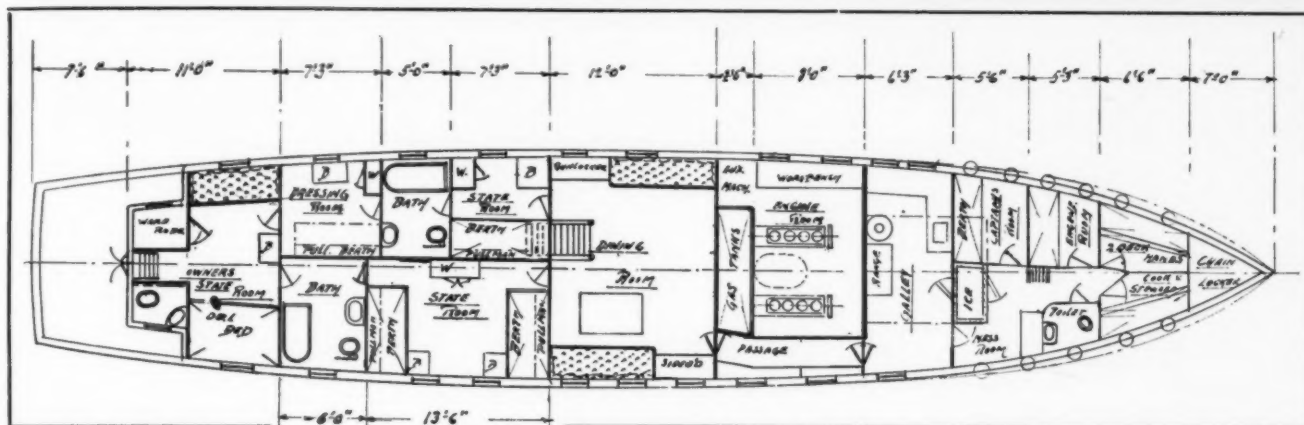
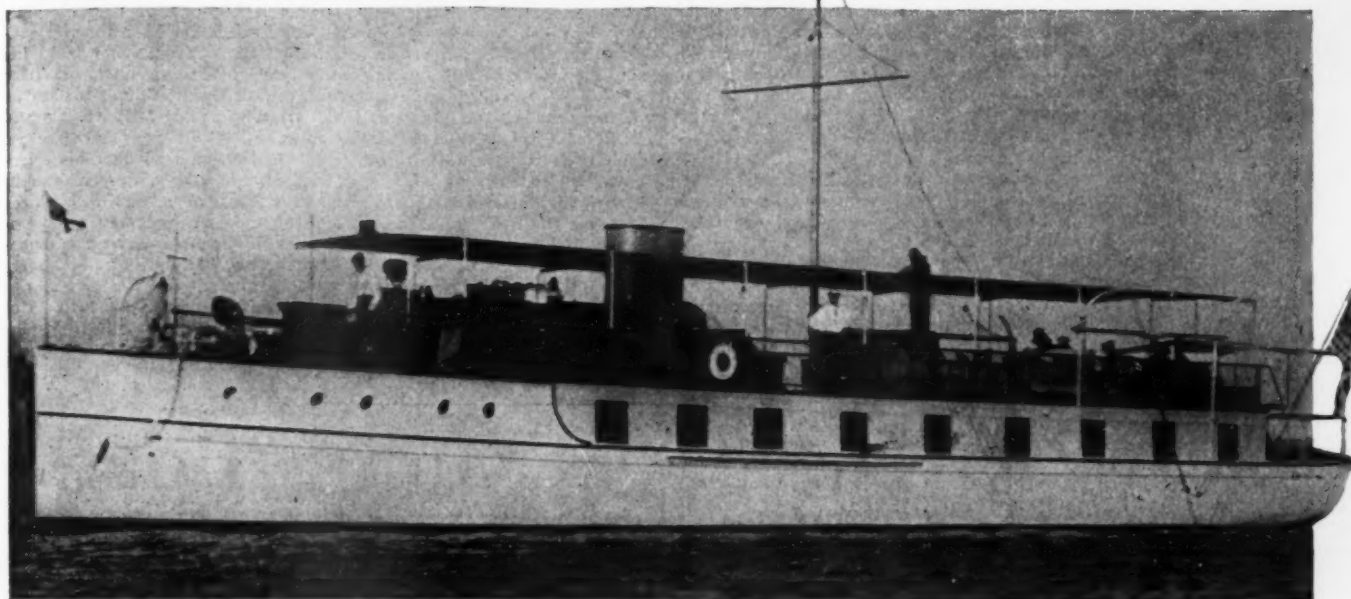
the room necessary for the forward saloon. The plans of the boat give a good idea of the amount of room that can be had in a boat of this type.

Next to size of boat comes the question of speed and power. An up-to-date houseboat should be able to cruise at a speed of 8 to 10 miles, and to do this it is, on account of the shallow draught, advisable to install two motors, and even then it is necessary to tunnel the stern to bring the propellers clear above the bottom of the keel.

As a matter of safety and also to facilitate the handling of boats of this type in narrow streams, twin screws have a great advantage over a single screw. From experience I have found it necessary to use two rudders on the extremely shallow draught



Lunaria is another 70-footer. Her hull has a draft of 27 inches and is better adapted for general cruising than that of Cocopomelo.



Ednada III is a 90-footer that is a nearer approach to the motor yacht. Her hull has draft and freeboard enough to make her capable of taking the outside runs with perfect safety.

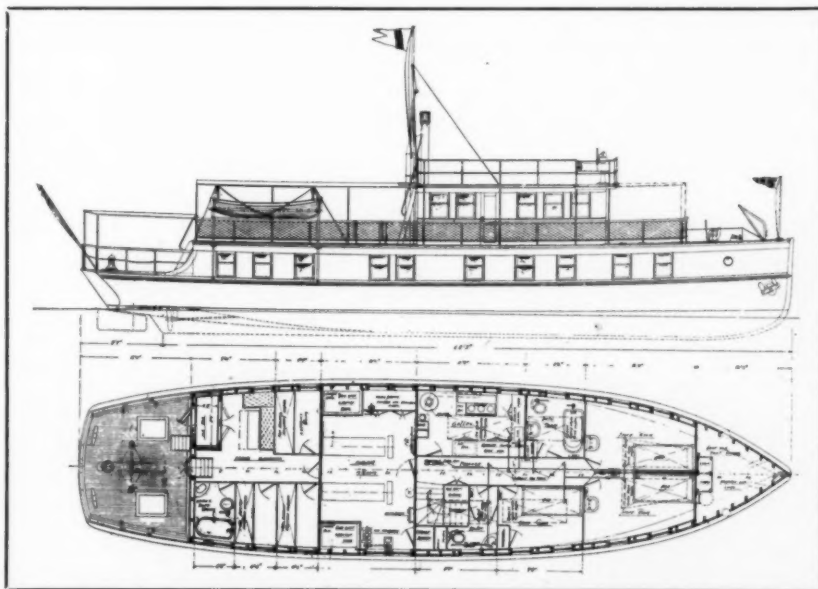
boats. Motors running between 400 and 500 r.p.m. are best suitable for the *very shallow boat* with small diameter wheels and large blades and small pitch, as they give better results both for speed and economy with the tunnel stern. The Lunaria as well as the Cocopomelo is fitted with two 25 h.p. motors, which give a cruising speed of  $9\frac{1}{2}$  to 10 miles. The cost of gasoline for running these houseboats from 9 to 10 miles per hour is only about 7 cents per mile with gasoline figured at 12 cents per gallon—yet this size houseboat offers more commodious quarters than a 90-foot yacht.

Experience proves the necessity of working out houseboats from a houseboat basis, of taking nothing for granted from general yacht practice. This is particularly true in regard to expense, the construction of the boat for strength and the proper distribution of weights in the hull. The location of the motors, which to the greatest extent affects the whole arrangement of the boat, has been open to an extended controversy, mostly from a theo-

retical standpoint. With the proper distribution of other weights, such as water, ice, stores, etc., and the hull longitudinally strengthened by hog braces, experience has shown that there is no disadvantage to placing of the engine in the after part of the boat, especially where the power is figured out for economical cruising speed such as 10 miles. If this type of boat is required to make 12 to 13 miles,

the machinery can be brought more amidship; this, of course, cuts into the arrangement and in most cases some comfort has to be sacrificed. The crew's quarters, galley and engine-room located aft leaves the owner the best part of the boat. With the companionway leading from engine-room to the after deck, which is used by the crew, the owner's quarters are perfectly private and free from odor from engine-room and galley. A glance at the plan of Lunaria will give the reader a good idea of what excellent accommodation for the owner this arrangement will give. Three large staterooms, one bathroom, private toilet for guest room, dining-and living-room 18 feet long and a mean width of 14 feet, all with windows that will assure plenty of light and air. Note the open stairway leading to deckhouse and the long, clear, open expanse of deck.

Regarding the heating of these boats, hot water has proven the most satisfactory, but great care must be taken in the run of pipes to allow for the proper circulation on



The 77-footer Lodona is a good example of the modern power houseboat and has all the requirements for cruising in both northern and southern waters.



account of the heater and radiator being on the same level.

The special tunnel construction seems to call for an explanation. We have heard repeated queries as to how it was possible to build a boat, like Cocopomelo with only 18-inch draught and yet use a propeller wheel with a diameter of 26 inches. The advantage of such a condition is apparent and the desirability of keeping the propeller from striking should the boat ground in crossing a shoal is evident to all. To accomplish this it is necessary to use the tunnel construction to set the propellers so that they are above the bottom line of the keel. The aft end of the tunnel is, of course, at the water line so as to allow a vacuum to be maintained in the tunnel.

It would naturally be supposed that the lift

of the water by the wheel above the water line would reduce the efficiency of the boat, but this is compensated for by the boat being closer to the surface and by the saving of the power referred to above.

Consider the many economical advantages of the houseboat to which we have briefly referred. Consider the fact that it is possible for the houseboat to go anywhere, that it provides comfort for an entire family wherever it goes. Is it taking too rosy a view of the matter to prophesy that as the attention of designers and boat owners is directed more and more to the houseboat that there will be changes almost revolutionary in the field?

Just as the man who wants speed has been willing to sacrifice comfort, so that many of the smaller motor cruisers are virtually ma-

chine shops, is it not natural that the man who wants comfort should be willing to sacrifice speed to a slight degree and build his yacht more along houseboat lines? Where he wants to go, how much accommodation he wants below deck, what size boat he gets and what size crew he has to carry—these are the factors that will determine whether his selection will be the more yachty, deeper draught houseboat of the Ednada type or the shallower draught houseboat of the Cocopomelo or Lodona type. Possibly he will desire a compromise between the two. Many indications seem to point that the Lunaria is the closest approach to the houseboat of the future. But he will want more comfort and it is his insistence upon this that will lead to a more thorough study of the houseboat problem.

# How to Design a Motor Boat.

Preparing for the Design—The First of a Series of Four Articles Presenting the Fundamentals of Motor Boat Designing in the Simplest Non-Technical Terms.

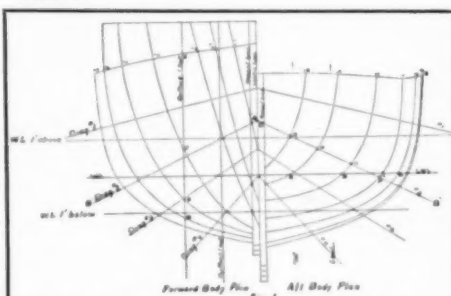
By L. B. Chapman.

THERE are a great many men to-day who from time to time have had the idea that they would like to design their own boats; others have tried but, through the lack of the proper knowledge, have failed. It is for such men as these that this series of articles has been prepared.

Of course, the writer does not expect to make anyone a naval architect; nor does he hope to teach the backwoodsman novice how to design a successful boat. The best he can do is to teach one how to start out and how to go about the actual work of designing. The success, as in all other undertakings, lies with the man himself. The articles are written for the non-technical boatman and everything will be sacrificed to that end. I am assuming, however, at the outset that the reader is more or less familiar with boats, their handling and construction, and has knocked about as a sailor man to some considerable extent.

Perhaps the most difficult part of boat designing is getting the right start. There are many things that one should know at the out-

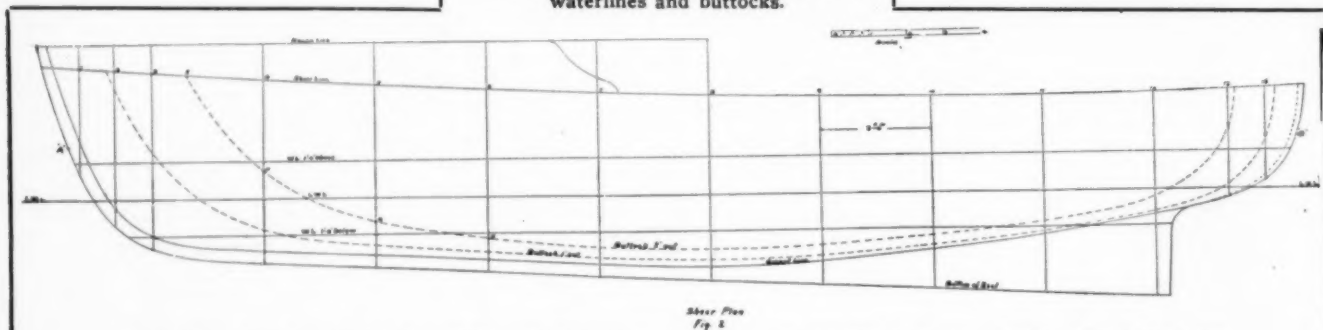
In his article on the design of a motor boat, Mr. Chapman has not attempted to condense the whole science of naval architecture into four short articles; he has merely considered the various operations by which a design is evolved and has so simplified the subject that no boatman should have difficulty in following it—Editor.



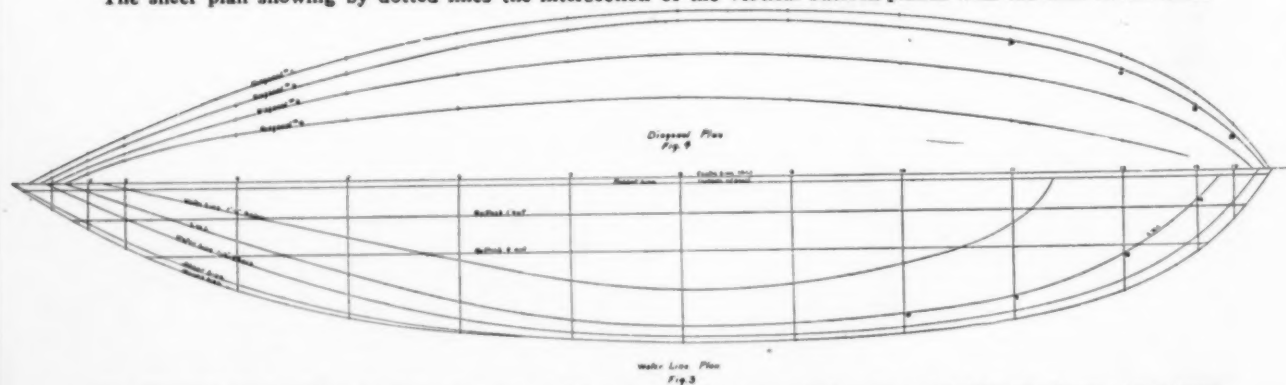
The forward and after body sections, showing also the planes of the diagonals, waterlines and buttocks.

set; the relation of the various plans to one another, why certain shapes and forms are better than others, the relation of power and speed, displacement, trim, etc. This month I am going to point out to the reader how to prepare himself to carry out a successful design. Next month we shall carry through a design in a systematic manner and learn how to "fair" the lines. The third month we shall see how to make the various simple calculations, as displacement, trim and location of weights; and lastly, when we are better acquainted with the art of designing, we shall take up some of the finer points of form, speed, weights, trim, stability, etc.

The designer should have the whole design as to dimensions, general shape, appearance, cabin arrangement, location of engine, etc., clear in his mind before he puts a single line on paper. To attempt and start out with no well-formulated ideas or outline, will only bring disaster and disappointment. Herein is the secret of failure or success. No doubt the yachtsman knows of what general character he wants his boat and has probably either seen or



The sheer plan showing by dotted lines the intersection of the vertical buttock planes with the skin of the boat.



The diagonals and waterlines are used merely to fair up the body plan and show more plainly the shape of the boat.

sketched out a boat that is about what he wants. What dimensions will she have? How deep? How wide? What speed and power? are a few of the many questions that come into one's mind. On these preliminary questions and considerations I could write a volume and the reader would be no better off in the end.

These are the things that you must look into and study up by yourself. The best that I can do is to point out how to study these things up and how to answer many of these questions yourself.

First of all, make up your mind about what general type and size you want your boat and then start in and look through back copies of *MoToR BoatinG* and other publications, and study all the designs and pictures you can find. Copy down all the data given on boats of your size and type and arrange it in some systematic order. After you have been through the magazines to some extent, try and make a sketch to a small scale, showing the general appearance of your boat. You never really know just what you want until you have made an attempt of some sort.

The amateur designer is hampered at the start. He has no fund of information and data that the professional naval architect has, but a few evenings spent as I have outlined will help wonderfully. Spend some of your spare time talking with yachtsmen and builders and study all the boats you can, especially their construction. If the reader will start out in this way, he will be surprised how quickly his ideas begin to take a definite form. Points that were hazy and dimensions that were unsettled a short time before begin to clear up and his boat becomes better and better outlined in his mind.

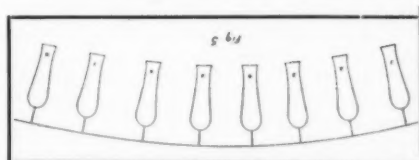
I will leave the reader with these few facts for the present and direct his attention to a set of lines, figures 1, 2, 3 and 4. This design was chosen, not because it has any particular merits, but because it has certain instructive points incorporated in it.

Let us turn our attention to Fig. 1, which represents the body plan of a boat laid out to a reduced scale. Only one side of the boat is shown, as both sides are the same; the right-hand part represents the aft sections and the left-hand part the forward sections, as indicated. These various curves or sections show the form at various places along the hull. They are numbered 1, 2, 3, 4, etc., and are shown at their proper place on the hull as straight lines, 1, 2, 3, 4, etc., in Fig. 2.

It is from this plan that the boat is built. As the reader is probably aware, the builder enlarges this body plan and makes molds the shape of the various sections and sets them up at their proper places along the keel. Thus, if

the builder had the body plan and an outline of the bow and stern, he could build the boat. The other plans and lines, such as water lines Fig. 3, diagonals Fig. 4 and buttocks (shown in Fig. 2), are only used to "fair up" the body plan and show the designer what sort of a boat he is turning out.

We can draw a series of sections, as Fig. 2, but we have no way of knowing that they make a smooth, fair boat, one free from bumps and hard turns, unless we connect



The spline and weights are used for drawing the longer curves, such as waterlines, sheerlines, etc.

points on the various sections together by other lines (as water lines, Fig. 3), which we know to be smooth, fair curves. For this reason the other plans are drawn.

Let us turn our attention to Fig. 2. The load water line is shown as "L. W. L." crossing the body plan. Now all the points on this line, as it passes along the hull and touches the various stations, must lie on a smooth, fair curve. Thus if a line is passed through *A, B, C, D*, etc., on the stations, Fig. 2, as they are on the actual boat, we should get a smooth fair curve, L. W. L., Fig. 3, *A, B, C* and *D*. Thus other lines are taken as shown W. L. 1'-0" below and 2'-0" below and lines drawn as in Fig. 3. Lines are also drawn about the hull in a diagonal manner (called diagonals). Thus a line marked Diag. No. 2 is drawn in Fig. 1, and points *M, N, O, P*, etc., taken on the stations and these are connected up in a like manner, Diag. No. 2, *M, N, O, P*, Fig. 4. In this design, which is all finished, these various lines are all smooth, sweet curves, but in yours they will not be. The sections will have to be constantly changed until all these various lines, Fig. 3 and 4, are smooth curves. This is called "fairing," which we will leave till next month.

I think that while many men grasp the significance of waterlines and sections, many are troubled with diagonals and buttocks. For this reason I will try to point out what these lines are: In Fig. 1 we see two straight lines crossing the plan at an angle, marked Diag. No. 1. This is a line starting well up on the bow at a point *A*, Fig. 1 passing down across the bilge *B*, and up to the stern to *D*. Of course, *A-B* and *B-D* should cut the L. W. L. in Fig. 1 at equal distances from the center.

The buttock is a line drawn at a fixed distance from the center of the boat (in this case 1 foot and 2 feet) starting from the bow, Fig. 1, at *E*. It runs down along the hull, as *E, F, G, H*. The points are lettered to correspond in Fig. 2. These are excellent lines to show the shape of the boat. Each line on the body plan is shown as its true shape in one of the other plans. All the various lines and points are carefully marked and numbered so that the reader can trace out any line for himself with ease.

Perhaps at this point it would be well to consider some of the tools and materials needed in carrying out a design. A very small outlay will purchase all the materials needed. The size of the drawing-board will depend upon the size of the boat. A good all-around scale to use is 1 inch to 1 foot. This will give a drawing varying from 20 to 40 inches, more or less. A cheap flat top table raised up to a comfortable height is the best drawing-board possible. Next, a good accurate steel or wood straight-edge (about 36 inches long), two triangles, a scale and three or four irregular curves should be procured. Compasses and other instruments can be purchased as needed. For drawing the various waterlines and diagonals, a spline (or batten) and several weights are needed, Fig. 5. A spline, preferably a celluloid one 36 or 42 inches long, and lead weights, can be obtained at any supply store.

I believe if we take a definite example and carry it through we can get a clearer conception than by talking about the general principles of design. For several years I have desired a boat, and for the last few months I have been thinking about it a good deal. I have consulted my pocket-book and talked with several builders, so that I know about what I can do. Lately I have been collecting data, studying designs and weighing one boat against another. I have studied engine catalogues and spent considerable time in the boat shops, in fact, I have become very enthusiastic and have decided that I will design my own boat. I have decided upon a cabin cruiser (I select this as a good illustrative type) and give the lines completed in Figs. 1, 2, 3 and 4. After considerable study and after having made a great many rough sketches, I have settled on the following dimensions, which may change somewhat as the design progresses: L. O. A., 34' 0"; L. W. L., 31' 2"; beams (extreme) 9' 0"; beam L. W. L., 8' 2"; draft forward, 1' 6"; draft aft, 2' 11"; freeboard forward, 3' 7"; freeboard aft, 2' 11"; freeboard least, 2' 7". Engine, 25 h. p., giving a speed of about 9 miles.

Next month we shall start out with this information and carry through the design, step by step, as a professional naval architect does.

## The Evolution of Grey Duck.

How Thos. L. Sturtevant's 66-Footer was Remodeled and Lengthened to 83 Feet, as Illustrated on Page Eight—Some of the Good Points of Her Design and Construction.

By George S. Hudson.

WHEN a seasoned yachtsman like Thomas L. Sturtevant, of Boston, undertakes the task of planning a yacht to provide accommodations during months aloft one may rest assured the result approaches the ideal. Several winters ago Mr. Sturtevant made the power cruiser Grey Duck II his home in Florida. Visions of added comfort and convenience growing out of this experience are now realized, he believes, in Grey Duck III, which really is the older boat lengthened and rebuilt.

Mr. Sturtevant is 70 years old, or it might be more truthful to say 70 years young. It is easy to infer that he is robust and loves the sea perhaps more keenly than in the days when

he raced and cruised in the scow schooner Redskin, known the length of the New England Coast because of originality that stuck out all over her model, the kinky rig and the striking coat of vermilion emblazoning her topsides.

The remodelled Grey Duck, which had her official trial last October, is 83 feet long and was evolved from a craft that taped 66 feet on deck and was built by Murray & Tregurtha Company, of Boston, in 1908. In this connection it may be of interest to state that Mr. Sturtevant's power yachts are never out of commission. During summer he is on the go in northern waters and, with chill of approaching winter, forsakes Boston for the sunny

South. Boats owned by this enthusiastic amateur have entered every port between Eastport, Me., and Miami, Fla.

Ideals sought by the veteran in this newest craft have been searched for by many others enrolled in the fraternity of cruisers. Mr. Sturtevant wanted abundant closet space not to be had in earlier boats, better ventilation and more light and air, a galley so roomy and convenient that capable cooks might be retained on the ship's articles without so much as a growl from the region of pots and kettles, shoal draft and moderate beam for crossing dangerous bars and negotiating canals, a heater that will heat and ample quarters for his family and crew of four. An entirely new



cruiser was uppermost in his mind while studying how the ideal might be attained.

Last year's boat, however, was too strong and able to be cast aside ruthlessly. She had carried him through many rough chances and was sound as a nut. It was decided, therefore, to give Grey Duck II increased length, furnish her a new interior and top, retaining shallow draft and augmenting power. Sketches outlining the alterations Mr. Sturtevant had in mind were submitted to the Murray & Tregurtha Company and the working plans were prepared by Designer Dinsmore of that firm. So Grey Duck II promptly went out of commission and was cut apart just abaft the galley. The keel was spliced and new frames gave her a bit flatter bottom aft without materially changing breadth of beam on deck.

Mr. Sturtevant decided that butternut with mahogany trim would lend a cheerful effect to the interior and those woods were selected with reference to grain and figure. He wanted the reconstructed yacht to be structurally strong to withstand buffeting should she ever be so unlucky as to stub her toe on the inhospitable beaches that glimmer and wait for ships that venture the passage between the Florida inlets. Steel girders and plating closely riveted were employed to effect this end. The low cabin trunk pierced with drop-windows was tied together amidships by ingeniously contrived plating, its upper section being cut away and sheathed with panels giving an arch effect at the foot of the main entrance.

Other bulkheads separate motor compartment from galley and the galley, in turn, is cut off from the living quarters by a stout metal partition pierced by a door. Another bulkhead isolates the 600-gallon fuel tanks under the after deck. Steel also enters into construction of the foundation of the pilot house so that, should a sea wreck the mahogany structure, water would find difficulty in getting below.

An open cockpit was tabooed by Mr. Sturtevant because he has been shipmate with such construction that flooded in rough chances so badly that 3-inch scuppers couldn't free it before another roller thundered aboard. Instead, the after deck is flush and has ample space for a dozen or more chairs. A skeleton deck rail extends entirely around the yacht and there are practically no nooks or crannies that afford a clutch for boarding combers. Experience born while severe gales were being

weathered either under power or at anchor has been the teacher of the apt owner of Grey Duck III.

Mr. Sturtevant's stateroom and toilet is aft with private entrance. Cleverly arranged closets, alcoves, lockers and drawers abound. Concealed under the side deck is a full-fledged writing desk which is revealed when a panel is dropped. A mirror covers the door leading forward. Double the stowage space of the older yacht has been obtained in her well-planned successor.

The main saloon, which occupies the best part of the craft's interior, is about 20 feet long with staterooms and baths at the after starboard end. The stairway has drawers under the steps which were built especially broad for the purpose. Two sofa berths and a pair of regulation berths are provided. A medicine closet, more lockers with latticed panels, a number of alcoves and deep closets are found in this generous compartment, which also has a mahogany dining table, sideboard and a gasoline grate that heats when its asbestos heart grows incandescent.

That Mr. Sturtevant retains captain, engineer and others of the yacht's complement year after year is proof that he is respected and just. In the latest boat he wanted Captain Staples to be under cover and have a stateroom. That's why he incorporated the pilot house in the new plan. And this same captain has been on the Sturtevant payroll 14 years.

The motor is installed directly under the pilot house. It is a five-cylinder, four-cycle, open base, one of the latest creations of the Murray & Tregurtha concern, and develops 120 h.p. at 400 revolutions, giving a speed of about 12 miles. Power has been almost doubled in the new boat, to effectively propel about 16 feet of added length. Two magnetos and two carburetors are included in the outfit because Mr. Sturtevant is fond of fishing and the yacht is seldom under way without a line stretched over the stern. By juggling spark and needle valve speed is so reduced that fish don't have to do a Marathon.

Obstruction in the fuel pipe is guarded against by a three-screen strainer with ground joint top alongside the carburetor. A single-cylinder motor operates the generator and a powerful bilge pump. Shaft bearings are oiled by a device fixed to the bulkhead so there is no necessity for lifting carpets and flooring in the living quarters with risk of messing mat-

ters with the dripping gun.

Particular attention was given installation of the steering gear and the wire-tiller ropes are guaranteed to sustain a weight of about ten tons. Turnbuckles are arranged behind removable sofa backs in the main saloon and the line may be inspected and repaired its entire length. Little things frequently overlooked in other and bigger cruisers have been thought out by Mr. Sturtevant and placed where they will be of service. He believes he has a solution for the excessive rolling problem by arrangement of swash plates in water tanks under the floor. Water serves, too, as ballast. Should the yacht strand, chances are in favor of releasing her by emptying the tanks and thus decreasing draft.

Every part of the boat is thoroughly ventilated. No corner of the bilge has a chance to become musty. The funnel cares for odors from the galley and heater. Circular ports, drop windows and a hatch render the motor compartment comfortable under all conditions of weather. A blower changes air in the hull's interior whenever required in Southern cruising. Powerful lamps are used in the electric lighting installation. Controls, of course, lead to the pilot house and, after the machinery has been started, Grey Duck III may be handled by one man.

Included in the equipment are two launches in which Ferro motors have given excellent satisfaction. These boats are on speed lines and do about 10 miles in smooth water. Magnetos are protected by waterproof casings, batteries are impervious to moisture and the installation is as nearly foolproof as ingenuity can devise.

Mr. Sturtevant never insures his floating property, depending on skilled hands and extra strong ground tackle. In three years of service the hulls of his cruisers have not suffered a chafe and the only damage that had to be replaced was a broken anchor that refused to part company with a coral reef. He favors a shoal type because it rides head on in current and breeze, one or the other factor being strong enough to prevent lying broadside. The shallow draft will wash up a beach, he declares, when the deeper keel would grip the sand and go to pieces in heaviest breakers.

The new Grey Duck is painted a light shade of drab and has iron-faced guards her entire length. She flies flags of the Boston and Quincy (Mass.) yacht clubs from a lofty signal mast.

## A Duck Boat That's Different.

**M**OTOR boats are commonly used nowadays around duck feeding grounds, both for carrying the sportsman to and from his blind, and in stalking the wily game bird in sections where the law permits the use of power craft. Seldom, however, has a boat been designed to cover so completely the intricate needs of the duck hunter, as that built for S. R. Martin, of Memphis, Tenn., by the Matthews Boat Company, of Port Clinton, Ohio.

The little craft is a 23-footer, and with her 18-25 Sterling engine, is good for 23 miles an hour. Painted a dead grass color she can easily lose herself among the dense marshlands of the South where she will be used.

The boat is built very strong and light, with cedar planking, canvas-covered decks, spray board at sides, coamings and spray shield. The top is so arranged that it can be used as a shelter tent when the owner sleeps on board. The after deck is built with coamings about the sides so that decoys can be carried there. It is designed as a one-man boat, with all controls brought alongside of the steering wheel. The engine is installed under two hinging hatches in a separate compartment.



The 23-ft. duck boat doing 23 miles an hour.

An interesting feature in the construction of this craft is the manner in which the exhaust is disposed of. The noise is completely muffled by carrying it through a bent copper tube with all jacket water passing out through this end. This arrangement is far better for duck shooting than the under-water exhaust, as the sound of the latter has been found to carry a great distance.

Mr. Martin has arranged for the after seat to be entirely portable with a removable bulkhead back of it. This gives a clear space of six feet six inches, allowing room for an air mattress to be laid on the floor. By using the Khaki hood, which completely covers the cockpit, he can remain in the boat over night without any inconvenience. All the fittings, such as top, windshield, etc., are entirely portable and can be rolled up and stowed away in a very small bundle.

There are many interesting little features throughout the entire arrangement and the boat meets a demand that has long been felt by the duck hunter, compelled as he has been, to use boats but little to his needs and with all this it is as trim in appearance as the up-to-date fast runabout.

# The Boston Motor Boat Show.

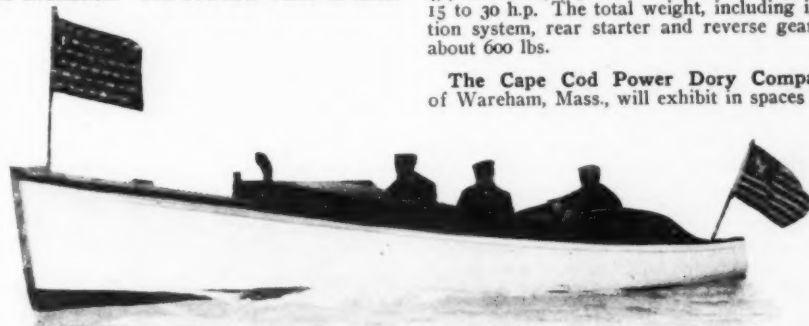
The Annual Exhibition of the New England Engine and Boat Association. Descriptions of the Exhibits that are to Be Seen at Mechanics Building.

The Atlantic Company, of Amesbury, Mass., which has also a Boston office at 89-93 Haverhill Street, will exhibit in spaces 26, 27 and 28. The display will include the complete line of their characteristic "Gurnet" dories. While not many changes will be noticed by the casual visitor, a critical observer's attention will be caught by the flaring bow on the 25½-foot "Gurnet" dory, which makes for increased dryness, and he will also notice that the stem is somewhat more plumb than heretofore, increasing the water-line length and displacement. The "Gurnet" dory is built in lengths of 18½, 20½, 23½, 25½ and 30½ feet, and in addition to this very complete line of family boats, there will be shown a 16-foot "Gurnet" dory skiff and a 17-foot "Gurnet" launch, both new designs for 1912. These are real boats, with both seaworthiness and passenger capacity, and will furnish the boat buyer of modest means an opportunity to satisfy his desire for a thoroughly first-class outfit at prices from \$180 upward. The 25½-foot and 30½-foot semi-speed clippers, which have been so popular with the boat-buying public, will also be shown, and the 30½-footer with a flared bow will be sure to attract favorable attention. Besides these boats, the Atlantic Company will exhibit a fast runabout, 28 feet

amount of oil pumped or the speed of the motor. The Bosch system of ignition is used. The water circulation is by means of a large rotary pump, large jacket area being provided around all cylinders, and the cylinders being cast enbloc provide for uniform temperature and circulation. The overflow water is taken

into a water-jacketed exhaust header and from this it may be taken overboard. The purchase price includes the Bosch magneto, reverse gear and rear starter, with everything complete to propeller shaft coupling. The engine is a four-cylinder, four-cycle, T-head, 4¼-inch bore, 4¾-inch stroke, developing from 15 to 30 h.p. The total weight, including ignition system, rear starter and reverse gear, is about 600 lbs.

The Cape Cod Power Dory Company, of Wareham, Mass., will exhibit in spaces 212,

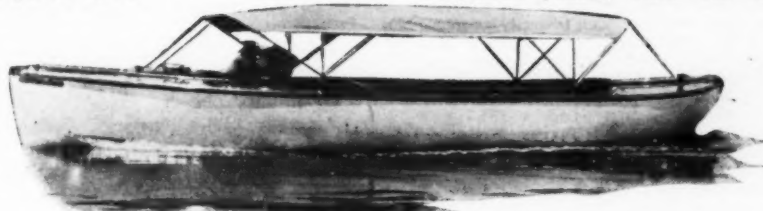


30-foot Speedway Runabout, of the Gas Engine & Power Co. and Chas. L. Seabury & Co.



One of the Cape Cod power dories.

long x 4 feet, 11 inches beam, equipped with their 20-30-h.p., 4-cylinder, 4-cycle Atlantic Chester motor. Those who have seen the plans for this boat predict that it will prove very popular as a fast runabout for family and ferry service and will also prove seaworthy for off-shore use if that is desired. The unit power plant, in which the engine is made complete with reverse gear and rear starter on one bed, will be a very convenient feature, admitting very simple bulkhead control and making the craft distinctly a one-man



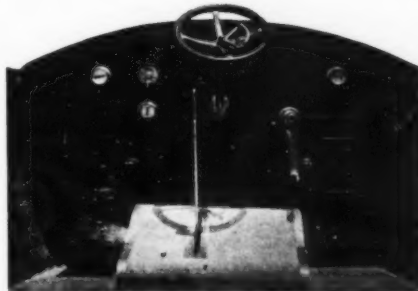
Atlantic Company's 30½-foot Semi-Speed Clipper Launch.



25½-foot Gurnet Dory, exhibited by the Atlantic Company.

boat. It will have mahogany decks, hatches and wash rail.

The "Atlantic Chester" four-cycle motor is an integral unit; that is, the motor, reverse gear and rear starter are on one base. Wearing parts, such as bearings are made unusually large, and crank shafts, cam shafts and valve stems, are heat treated and hardened. Access to the base is provided by two large hand-hole plates on each side of the motor, through which practically the whole interior may be reached. Large valve areas requiring but short lifts make a quiet-running motor. Lubrication is obtained by means of a plunger pump, throwing a constant stream of oil under the No. 1 cylinder, from which it overflows and is retained under each of the other cylinders by baffle plates, maintaining a constant level under each connecting rod, regardless of the



Bulkhead of 30-foot Speedway Runabout, showing convenient arrangement of controls

weather better and look better in the long run than an oak deck, although not quite so fancy when first put on. The boat is painted white outside to the water line with anti-fouling paint below, khaki inside, decks light buff, half round, chocks, cleats, washboard finished with spar varnish and light green inside the cabin. The exhaust is through the stern under water. The steering gear consists of a galvanized wheel at forward end of cockpit, the ropes leading aft in cockpit to tiller under the after deck, and access to the tiller may be had through the cabin. The gasoline tank is of heavy galvanized iron, cylindrical in shape, securely fastened to the forward-deck timbers. All gasoline pipes are of seamless drawn, copper tubing and water piping is of rubber hose fastened to brass nipples, batteries and coil are placed under the after deck, away from all dampness, rudders are of oak, with galvanized-iron rudder post and skeg iron. The rudder is fastened to the post by galvanized-iron straps. These boats retain all the sea-going qualities of the old dory, but have none of its crankiness and cannot easily be surpassed for seaworthiness and comfort. The motor is located aft in the cabin and by a new arrangement of cabin door and slide, it is possible to have one open and the other closed, thoroughly protecting the motor and yet making it easily accessible. The Sportsman's Fishing Boat is 16 ft. long, 4 ft. 10 in. beam,



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about 12 inches draft and weighs approximately 700 lbs. Although designed primarily for sportsman's use, it has great carrying capacity and is adapted for use as a tender or small family boat. The motor is housed in the cross seat, but is readily accessible in case of repairs. The forward seat is boxed to form a well, where bait and live fish can be kept, the after seat is boxed to form a large locker and batteries, coil, tools, etc., can be kept in the middle seat in the space not occupied by the motor. No wires or piping are exposed. A 7-gallon gasoline tank is fitted in the bow and seamless-drawn copper tubing leads to the motor. An oak washboard is steamed and fitted in around the cockpit and finished with spar varnish. The boat is painted a dead grass color outside, straw-color decks and khaki inside. A good feature is that every part of the power plant is kept out of the way, making the boat clean and obviating any danger of lines becoming entangled in the machinery, and is yet very accessible. The boat can be powered with a Palmer motor  $3\frac{1}{4} \times 3\frac{1}{2}$  inches, or a Ferro special,  $3\frac{3}{8} \times 3\frac{3}{4}$  inches, and with either will make about 7 miles an hour.

**The Toppan Boat Manufacturing Company**, 25 Haverhill Street, Boston, Mass., will exhibit this year in spaces 33 and 34. Here will be found the company's 30 x 8-foot raised-deck cruiser, equipped with a 12 to 14-h.p., two-cylinder engine. The boat is a dory model, suitable for rough-water work, very roomy, with engine housed in and fly wheel in the cabin so that the boat can be run from the cabin in stormy weather. The boat is planked with 1-inch pine, has 8 water-tight, glass-hinged port lights in the cabin, toilet room partitioned off, ice-box under after seat, two extra wood berths to sleep four and is ceiled in cabin. Interior of cabin is finished in white enamel, oak combing, natural finish, boat painted white outside and copper paint below water line. The boat will make about 10½ miles and sells for \$1,650. In this exhibit there will also be a 26-foot, raised-deck cruiser, 7-foot beam, equipped with an 8 to 10-h.p., two-cylinder engine, selling for \$1,000, and an 18-foot, open standard dory, equipped with a 3 to 4-h.p. Toppan jump-spark engine. In addition to these boats, the visitor can examine one of the new type 18-foot launches with a 3-h.p. engine, equipped with a red automobile top. In space 88, a 19-foot oak-finished dory will display the Claflin fog horn. This boat has already been sold to the Adams Square Bowling Company and will be the first prize at the bowling tournament now being held at their rooms in Boston. A 26-foot Toppan standard dory launch will also be exhibited with an 8 to 10-h.p., two-cylinder engine of the new 1912 model. The launch is of the new keel type with V-stern and is designed by J. A. Potter, the naval architect, and is a very fine-appearing craft, roomy and very seaworthy.

**A. R. True**, of Amesbury, Mass., will have spaces 217 and 219, where the visitor can see a 20-foot, smooth-seam dory launch, equipped with a 5-h.p. Vim motor. This design is built in two grades, grade A with wash rail, decks and mouldings plugged and finished bright, inside of boat ceiled up, equipped with a 16-oz. cold-rolled copper tank, cushions and brass fittings, and grade B, wash rail and mouldings finished bright, decks painted and equipped with galvanized tank and fittings. This boat is built at prices ranging from \$250 to \$650, depending on the length and the type of motor. With the dory will be exhibited a 12-foot skiff of a type suitable for tenders. In addition to the boats exhibited, A. R. True also builds a very attractive model of hunting cabin cruiser with a V-stern in 25, 28 and 30-foot lengths, a 16-foot lap-streak power dory suitable for harbor, lake or river use, with a beam of 4 feet 6 inches, at prices ranging from \$130 to \$150, according to the type of motor installed, and a whale-boat launch, designed and built especially for rough-weather work around Cape Cod. These latter are one of the safest small boats afloat and are regular keel boats built on oak frames 1 inch x 1½ inch and planked with ¾-inch pine. This boat is built in 25, 28 and 30-foot lengths at prices ranging from \$510 to \$800.

**The Gas Engine & Power Co. and Chas. L. Seabury & Co., Consoli-**

**dated**, of Morris Heights, New York City, will have their exhibit in spaces 35 and 36. The display will include a 30-foot runabout with a beam of 6 feet and a draft of 2 feet 2 inches. This is a real "boat-mobile" and is built to make 14 to 15 miles per hour. The boat is cedar planked with oak frames, copper riveted and the decks, coaming, covers over motor and interior trim are of selected mahogany. The motor is a 4-cylinder, 4-cycle, 18-22 h.p. "Speedway," with jump-spark ignition, McCord force-feed oiling system, copper fuel tank set in copper pan, Tobin bronze propeller shaft, bronze propeller wheel, strut and stern bearing. The motor has an outside copper feed pipe and can be fitted with either magneto or dynamo. The starting crank, switchboard, gauges and gasoline valve are on a bulkhead aft of the engine and the controls to motor are on the steering wheel, as is found in automobile practice. The launch is without vibration or noise, is a good sea boat and sells for \$2,650. In addition, the company will exhibit its six-cylinder, 50-60-h.p. "Speedway" engine, with oil-leveling system and Bosch dual system of ignition. The cylinders are 6-inch bore by 6-inch stroke. There will also be a 4-cylinder, 4 x 4½-inch "Speedway" motor.

of various types and sizes of cruisers will be displayed in an attractive way, giving the visitor a fair idea of the appearance of the boats when finished. Models of frames will also be shown, illustrating for the prospective purchaser the exact way in which the Monitor frames are put together to the smallest detail. The product of the Monitor Company is principally fully fitted frames; that is, frames which have been erected and all ribs fitted and bent to their proper place in the boat so that the purchaser has only to set up and permanently fasten the parts together to make it ready for planking. This can be easily done by the purchaser, as the holes are bored for the permanent fastenings. The Gere method of easy-boat building does away with the necessity for paper patterns, rough building molds or forms, or the fitting up of a steam box for reshaping or fitting the ribs. The buyer of a Monitor frame can obtain his plank with the frame, shaped and with steam-bent boards, if he pleases, or by following the very simple instructions, get out his own plank at home. The method followed by the Monitor Company makes the planking of a boat an extremely simple matter and no one need hesitate to undertake the work. One noteworthy feature



The Toppan 26-foot dory cruiser.

A. R. True's smooth planked sea-going dory.

Besides the launch and engines will be seen a representative of the "Speedway" alcohol yacht range, which is designed to use denatured alcohol as fuel. It is 20½ inches long, 17 inches wide, 24 inches high and weighs 51 lbs. The body is made of sheet steel with sides, top and back galvanized, and is lined with 3/16-inch asbestos millboard and sheet steel, making a double casing. The door is iron with a steel frame. The alcohol reservoir is of copper, with brass valve and strainer, and brass-pipe connections from burner. A thermometer is fitted into the door, to indicate the temperature of the oven. The range is made in two sizes, No. 1 having two burners in the top and one in the oven (the size exhibited), and No. 2, having four burners in the top and two in the oven. The prices are \$50 and \$60, respectively.

**The Wolverine Lubricants Company**, of New York, will occupy space No. 329 at the Boston Motor Boat Show, where they will exhibit a full line of Wolf's Head Marine Motor Oils and Greases, as well as a full line of their Wolf's Head Crystal Oils. The display will show the oils themselves as well as the various trademarked cans and packages in which they are sold and marketed throughout the different branches of the trade.

**The Monitor Boat and Engine Company**, Newark, N. J., will have their exhibit in space No. 216. This company manufactures exclusively knock-down boat frames for all types, styles and sizes of boats, from the small yacht tender to the large passenger or freight boat 60 ft. long with maximum of 15 ft. beam. Models

of this method is that a customer is not confined to a strict line of catalogue models, but can have his choice of length, beam, style of stem and stern, headroom, etc., and can practically dictate the essential features of the boat he has in mind. Hundreds of boats have been built and are being built, using Monitor material, and visitors at the show will be given every opportunity to become familiar with the models and construction features, as the exhibit will be handled by Mr. Geo. H. Gere himself.

Spaces No. 20, 21, 22 and 23 will be occupied this year by the **Kershaw-Williams Company**, 29-33 Haverhill Street, Boston, Mass., which handles various makes of marine motors, motor boats and accessories. Exhibits will be placed in the following order: Beginning at space 20: Rice Brothers Company, East Boothbay, Me., a 20-foot mahogany-finished runabout, equipped with a Rice 4-h.p. motor, selling at \$275; a 20-foot mahogany-finished runabout, driven by a Rice double-cylinder, 10-h.p. motor, with Joe reverse gear, guaranteed to make 12 miles per hour, selling at \$375. C. F. Roper & Company, a full line of Roper safety reversible propellers. Fulton Manufacturing Company, a display of Fulton self-sparking, two-cycle motors, from 2½ h.p. to 15 h.p. Kershaw-Williams Company, 25-foot, bright-cedar, mahogany-finished runabout, equipped with a 40-h.p. Erd special, light-weight, high-speed motor, guaranteed speed 22 miles per hour, selling at \$1,400, and a 20-foot family launch, equipped with a Fairbanks-Morse two-cylinder, 7-h.p. engine, price \$500. E. M. White & Co.,

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a 20-foot sponson power canoe, equipped with a 3½-h.p. Erd motor, at \$285, and a 10-foot canvas-covered yacht dinghy, at \$50; also paddling canoes, etc. Erd Motor Company, a complete line of Erd and Erd Special motors, both 2 and 4 cycle, from 3½ h.p. to 60 h.p. Fairbanks, Morse & Company, a line of 2-cycle motors, from 3½ h.p. to 24 h.p.

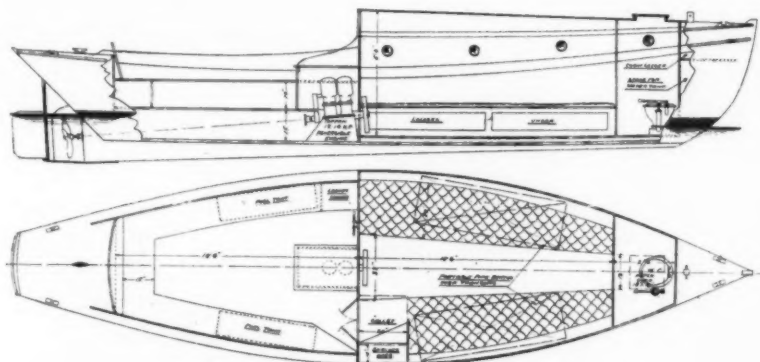
The Carlyle Johnson Machine Company, of Manchester, Conn., will display their line of reverse gears and friction clutches in space No. 75-A. The friction clutch is made in five sizes, single or double, to fit any shaft up to 3 inches in diameter, and is adapted to machine shop or factory equipment on the overhead line or countershafting. A cut-off coupling type is designed for use in motor boats and makes a small, neat, compact clutch capable of handling considerable power at high speeds where a reverse is not required. Of special note in the exhibit will be the new type of reverse gear which the company is offering for 1912. It is compact and neat, silent and powerful, incased, but easily accessible and is adapted to any marine engine from 1 to 10 h.p., with a heavy-duty type for use up to 30 h.p. A full description of this gear will be found in the "Yard and Shop" section of this issue.

ing out two new distinct models for 1912. One in a single cylinder, 3 h.p., of unusually simple design and construction, and as it can be manufactured in very large quantities, the selling price will be an exceptionally low one. This motor has 3¼-inch bore, 3½-inch stroke and weighs 98 lbs., is of the three-port system, with special non-back firing device in by-pass, having all the advantages of the simplicity of the three-port motor with its great disadvantages eliminated. The engine has long, interchangeable bearings, both main bearings and connecting rod, and is designed to lubricate through the gasoline. Although this motor will sell for a remarkably low price, it will still embody the usual Gray qualities, high-grade material and careful workmanship, such as ground cylinders, piston rings and pistons, piston pins bronze bushed, ground crank shaft, long bearings, baked enamel finish, elevated timer control and Price carburetor. The other new model is a double cylinder, 6 h.p., with 3½-inch bore and stroke and weighs 138 lbs. The 6 h.p. answers the same general specifications as the 3 h.p. Like it, it is designed to lubricate through the gasoline and is one of the most simple motors on the market. It is light enough so that it can be used in a canoe

proper thickness of metal and the opening covered with a brass plate securely fastened and tested with a water pressure of 60 lbs. Crank shafts are forged from a solid steel billet and made of a special high carbon steel on the medium-duty models and of Krupp chrome steel on the high-speed models. All crank shafts have a flange forged on, to which the fly wheel is bolted instead of using a straight shaft and key. Valves are interchangeable and operate mechanically. The heads are cast iron into which is pressed and electrically welded a steel stem. Crank cases are reinforced with a stay rod running through the lower half and extending up through the upper half, which connects both halves and supports the top of the case, giving absolutely no chance for the cylinders to shift. The reverse gear is of the planetary type and the clutch of the multiple disc type. All engines are equipped with mechanical force-feed oilers, and on the high-speed models a pump system is used in addition. The type "C" motors have two independent systems of Bosch ignition, are equipped with a special carburetor and have a number of other small improvements. These engines are built in six, eight and twelve cylinders.

The Loew Manufacturing Company, of Cleveland, Ohio, will show a complete line of the Loew Victor marine engines in spaces No. 68 and 76 and, in addition, will have on view a kerosene engine. The display will include six sizes and types, both high and medium speed, and will embody the company's improvements for 1912. These include two separate and distinct systems of ignition with Bosch magneto, Connecticut igniters, two systems of oiling (splash and mechanical), with air compressor which requires no attention from the operator whatever, no safety valves or intake spring valves, and the new and improved disc clutch. These improvements make the 4 and 6-cylinder engines, as well as the smaller sizes, probably the most completely equipped motors ever shown as stock machines.

The Regal Gasoline Engine Company, of Coldwater, Mich., will occupy the same space at the Boston Show they had last year and will be represented by salesmen from the factory as well as by their New England distributors, the Seager Engine Works, of 65 Beverley Street, Boston. There will be about half of the complete line of Regal four-cycle marine engines exhibited on the floor. These engines are classed as light duty, medium, and heavy duty, the line of light-duty engines, including the 3, 8 and 12-h.p., 1, 2 and 4-cylinder engines, respectively, the medium-duty being represented by 5 and 10-h.p., 1 and 2-cylinder motors, and the 2-cylinder, 14-h.p. and 4-cylinder, 28-h.p. typifying the heavy-duty engines. There have been a number of improvements and additions made by the Regal Company to their line of engines this last year, which more firmly establishes their position as one of the progressive manufacturers and leaders in the experimental and engineering fields. The chief change made is found in the light-duty engines, which have all been altered to take a manifold similar to that of the medium and heavy-duty motors. This manifold is a characteristic feature of Regal engines, and can be seen in the accompanying cut as the long cylindrical casting that extends the length of the engine. It contains the inlet and the exhaust passages and, since both are water-jacketed, there is not only the advantage of cooling the exhaust gases, but in addition, the inlet gas passages are kept at uniform temperature, which is just warm enough to prevent condensation of the fresh gases, a highly desirable feature in this day of low-test gasoline. Other changes have been made in small details of some of the engines, such as in lubrication, valve springs, timing and cam design, all calculated to give more power, longer life and to make them even more desirable motors than heretofore. The company has also brought out four new model engines during the past year. They are a 3-h.p. single-cylinder engine, 6-h.p. double cylinder, and 12-h.p. and 32-h.p. 4-cylinder. The first three are light-duty engines, have the same size cylinders, 4-in. bore x 4½-in. stroke, and in general design are similar to the rest of the Regal engines. The 6 and 12 h.p. motors have their respective reverse gears in the extended engine base and are equipped



Design of 30-foot Toppan dory cruiser.



Two types of Monitor K. D. frames.

Arthur P. Homer, 156 State St., Boston, Mass., will exhibit in space 55A, where he will have one of the new 25 to 35 H.P. Sterling engines on exhibition, of the heavy duty type for cruising, with a bore of 5½ inches and a stroke of 8 inches. In the same space will be shown a model of the "Dixie Junior" 20-foot hydroplane. This model will be of special interest to the growing class of motor boatmen attracted by speed boats of the faster type. A Reynolds motor will be shown in space 55B and also a sectional model of the Reynolds engine showing the full operation of this type of rotary valve machine. Arthur P. Homer is also agent for the Eagle line of marine engines which are to be exhibited in the name of that company in spaces 56, 57 and 58.

The Evans Stamping & Plating Company, of Taunton, Mass., will have space No. 105, which they have occupied annually for the last three years. Here they will show a full line of the Paragon Reverse Gears, including eleven sizes. On five sizes the gear construction will be shown, as well as a completely disassembled gear, showing the quality of material, workmanship and design. The company also manufactures one-way clutches, Tuttle tapping machines, Vava syphon mill oilers, and nickel-plated stove trimmings.

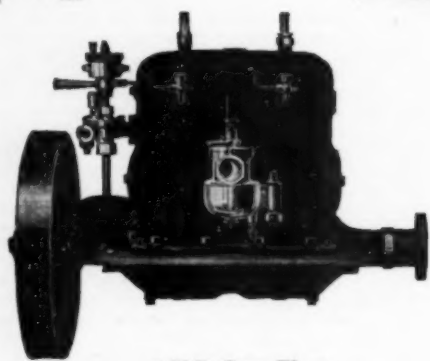
The exhibit of the Gray Motor Company, of Detroit, Mich., will be handled by their eastern agent, Walter J. Forbes, of 243 Columbus Ave., Boston, Mass., in spaces 54 and 60, where the complete line of engines will be shown. The Gray Motor Co. is bringing

out a 14-foot dinghy, and at the same time is strong enough to drive a 25-foot family launch at a fairly good speed. There has been for a long time a great demand for a smooth-running, compact, reliable double-cylinder engine that could be sold at a reasonable price, but so far most of the really good two cylinder, 6 h.p.'s were just a little too high priced to sell in quantities, and the Gray people feel that in this new model they have designed a double-cylinder, 6 h.p., that can be manufactured in a manner to cut down the cost and at the same time have durability, efficiency and reliability.

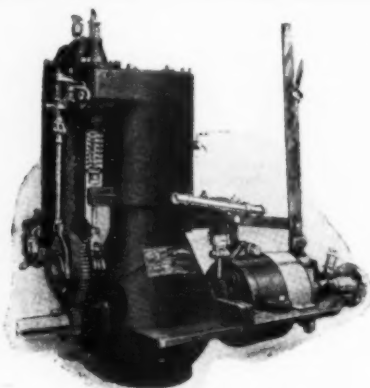
The display of the Van Blerck Motor Company, of Detroit, Mich., is exhibited by Wentworth W. Meek, in space 101. Four models will be shown, comprising the type "B," 2 cylinder, 15 h.p.; type "B," 4 cylinder, 35 h.p.; type "B," 6 cylinder, 45 h.p., and a type "C," 6 cylinder, developing 130 h.p. This latter is a light-weight, high-speed motor with a bore of 5½ inches and a stroke of 6 inches, and develops its horse power at about 1,400 r.p.m. This type of engine made a splendid record in the "Gretchen II," "Kitty Hawk II," and "Reliance IV," etc., during the recent season and bears the name of the "Van Blerck Thoroughbred." The type "B" engines have a 5-inch bore and 6-inch stroke and are of the medium-duty class, suitable for pleasure, cruising and commercial boats and are also equipped with aluminum bases for runabouts and fast cruising boats. Van Blerck motors are of the four-cycle, T-head type and are cast separately. On the medium-duty motors, a cylinder with a cast water jacket is used and on the high-speed motor cylinders, which are considerably lighter, an open water jacket is used to insure



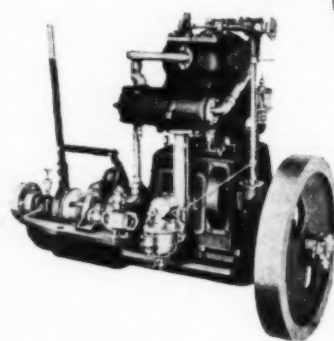
# THE - BOSTON - SHOW



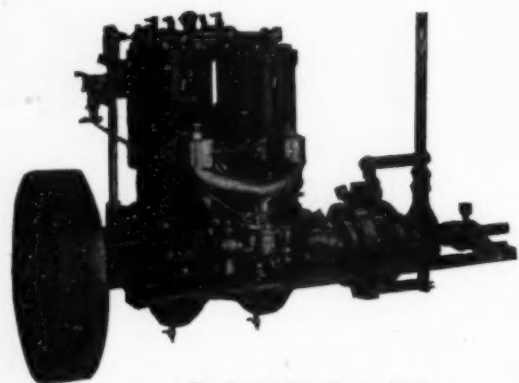
6-H.P. Gray Flyer.



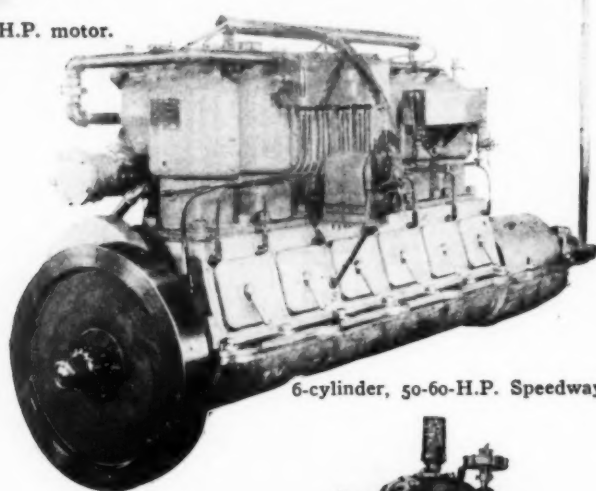
Wolverine 5-H.P. motor.



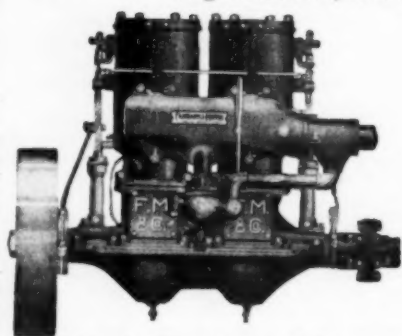
Regal Engine Co.'s Type "A."



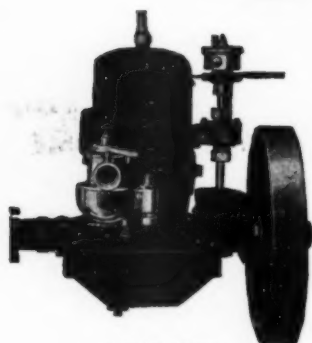
Eagle model 2D, 12 H.P.



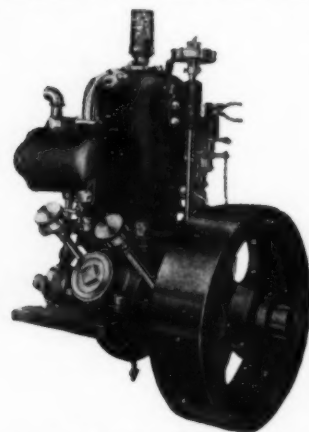
6-cylinder, 50-60-H.P. Speedway.



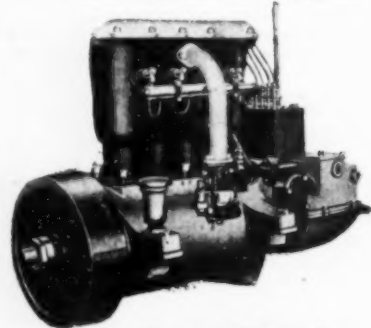
Fairbanks-Morse two-cylinder.



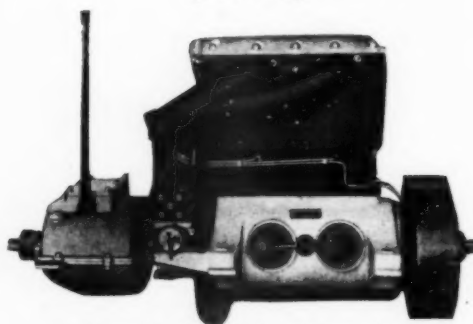
3-H.P. Gray.



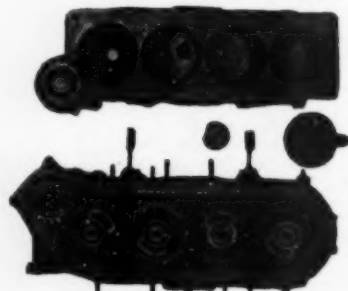
Eagle model C, 6 H.P.



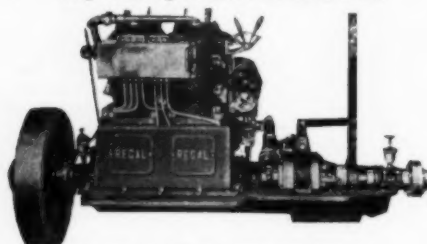
Reynolds 15-20 H.P. engine.



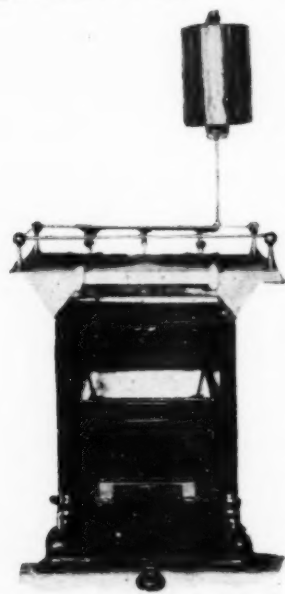
Reynolds 15-20 H.P. exhaust side.



Top and bottom of Reynolds cylinders showing rotary valves.

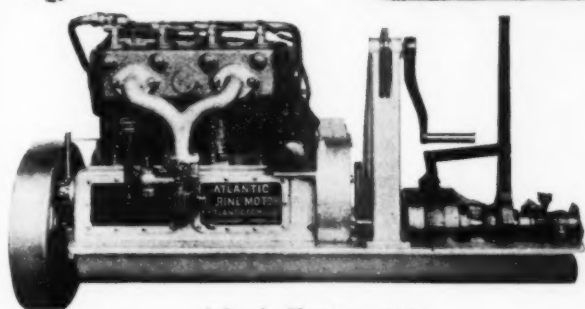


Regal, 10-H.P., medium duty.

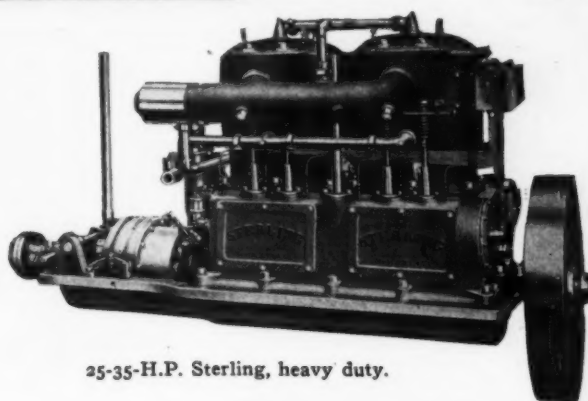


Speedway alcohol yacht range.

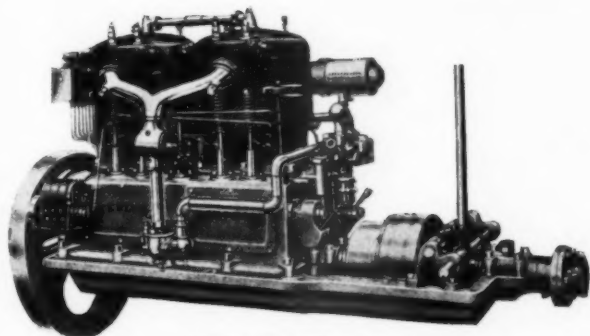
# THE - BOSTON - SHOW



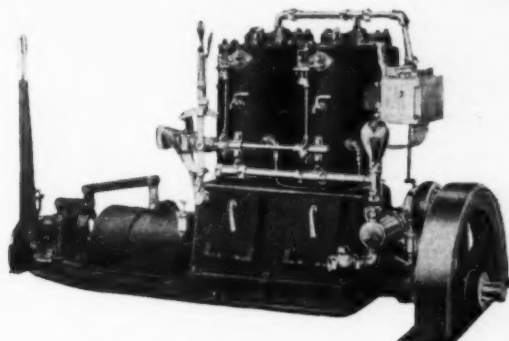
Atlantic-Chester motor.



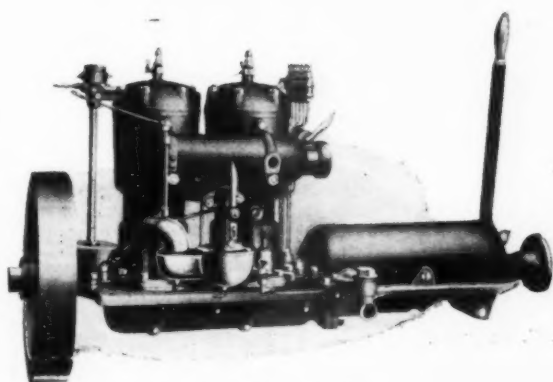
25-35-H.P. Sterling, heavy duty.



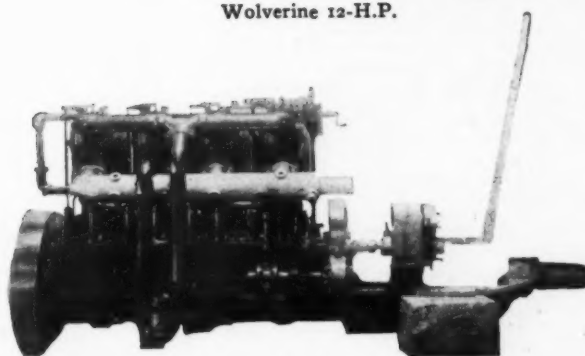
Sterling four-cylinder, type D.



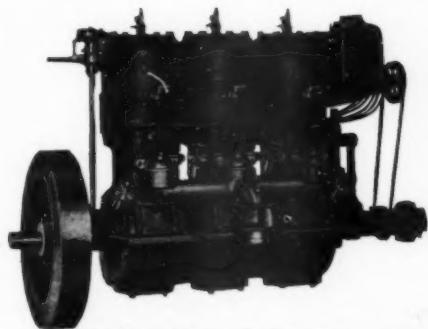
Wolverine 12-H.P.



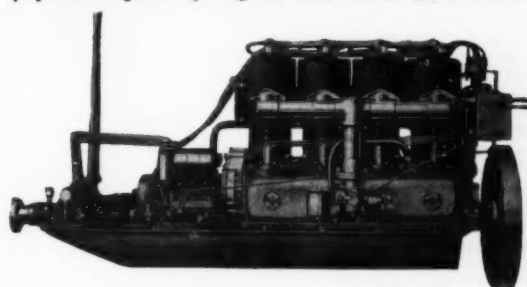
1912 Ferro engine.



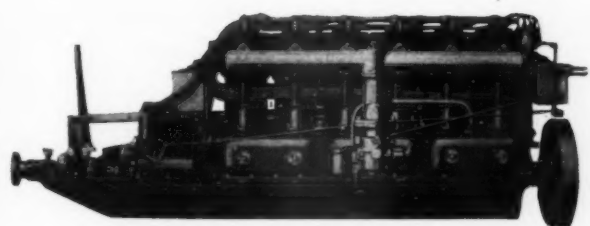
4-cylinder Speedway engine, with Bosch ignition system.



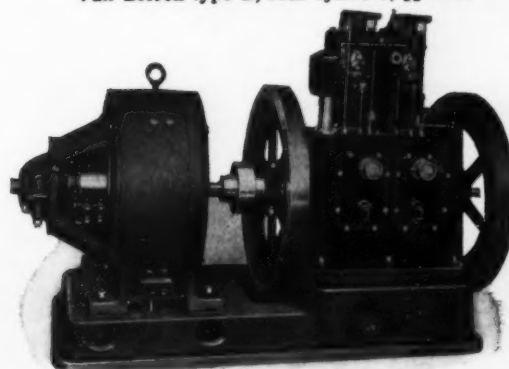
Goshen three-cylinder engine



Van Blerck type B, four-cylinder, 35-H.P.



Van Blerck type C, six-cylinder motor.



Lunt-Moss Company electric lighting plant.



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with force-feed mechanical oilers. The 12-h.p. should prove useful in a field for a small 4-cycle engine that is very much undeveloped. It is a compact, neat-looking engine, gets its guaranteed power at 700 r.p.m., and should sell readily for power in open launches and small cruisers. The 32 h.p. mentioned above is an automobile marine engine, expected to sell as a marine engine in speed boats and is built in accordance with the latest developments in automobile engineering. It is built light with an aluminum crank case and base, three-bearing crank shaft and cylinders cast in pairs of 4 1/4-inch bore x 5 1/4-inch stroke. This engine is not exhibited at the show. Regal engines are designed by engineers that have, added to their knowledge of the theory of internal-combustion engines, the knowledge that only can be gained by long years of experiment and watching closely engines they have designed actually working. Regal engines are built by a firm that has been making marine engines for eleven years. All the different models and sizes of these motors are completely described in their very attractively gotten-up 1912 catalogue, which they will be glad to send on application.

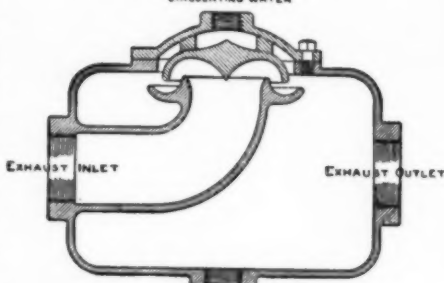
Wentworth W. Meek will exhibit the line of marine engines made by the **Goshen Motor Works**, of Goshen, Ind. The exhibit will consist of a two cylinder, 8 h.p., two cylinder, 16 h.p., and single cylinder, 4 and 8 h.p. The Goshen Company prides itself on the fact that it has developed an engine that possesses all the merits of both the two and three port engines. Goshen motors have a springless check valve which has many advantages over the poppet valve. It is a well-known fact that it is practically impossible to secure 3 or 4 springs of exactly the same strength, and it is still more difficult to get these springs adjusted to the same tension, which must be done, however, to get uniform results from all the cylinders. The Goshen construction obviates this difficulty and allows the cylinders to fill completely with the mixture. Another good feature of this make of engine is the accessibility of the piston and connecting rod. These parts can be removed for examination and repairs without disturbing the engine on its foundation or even moving the exhaust pipes, oil tubes, carburetor, timer or wires. The Goshen Works build engines with one, two and three cylinders from 3 to 50 h.p.

The **Ferro Machine and Foundry Company**, Cleveland, O., are offering their Standard two-cycle engine for 1912 in a complete range of sizes and equipments in both jump-spark and make-and-break ignition. New models of these engines will be seen at the Boston show. While no fundamental changes have been made in the Ferro engine, a number of features are included in the 1912 line which are rather unique. The cooling system employed is not only very simple, but has an excellent feature in that exposed pipes and joints, which always have a tendency to leak, are done away with. Leaving the pump, the water, as it enters the cylinder, divides and passes upward on either side of the exhaust port and then up and around between the cylinder walls and into the cylinder head, from which it passes into the exhaust manifold, whence it can be piped either into the exhaust pipe or directly overboard as desired. In designing the water jackets, the water space has been made widest at the top of the cylinder where the greatest heat comes, thus perfectly equalizing the heat expansion of the cylinder. The lubricating system is also unique. It is of the positive pressure type, very simple in design and construction, consisting of an exceptionally small number of parts with consequent reduction of complications or breakdowns. A new idea is employed in connection with the 1912 Ferro reverse gear. The entire gear is fitted with a metal cover, which encloses all moving parts, protecting them from dirt and injury and preventing any possibility of grease from gear parts getting on clothing or the floor of the boat. The cover can be easily removed for inspection or oiling purposes. The Bosch high-tension magneto is installed as standard equipment this year.

The **Lunt-Moss Company**, which has its factory at Hillsdale, Mich., and its home office at 43 South Market St., Boston, will exhibit an interesting and attractive complete electric-lighting plant, shown in actual opera-



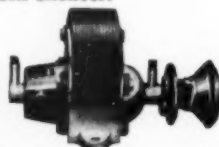
Melon spray-hood made by Chas. P. McClellan.



Thermex silencer.



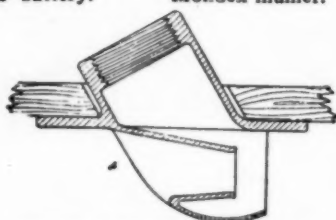
Burn-Boston liquid battery.



Motsinger D. C. magneto.



Mondex muffler.



Thermex underwater exhaust.



Motsinger auto sparker.



Valentine Valspar.

tion, under ordinary working conditions, in space 229. The outfit consists of a 12-h.p. double-cylinder gas engine, connected direct to an electric generator and is used to light the exhibitor's booth, making it by all odds one of the most brilliantly lighted of any in Department B. In addition to this lighting plant, the company has on exhibition in the same booth, a complete water-supply outfit, such as is generally used for service in country residences, hotels, institutions, etc. This exhibit will be of interest to every visitor at the show, especially to those who have anything to do with country residences and estates. Besides these two complete plants, there is also on exhibition a large number of accessories for use in connection with such systems, and in the same booth the visitor can see the celebrated Automatic line of marine engines, a line which is very attractive in appearance and should not be missed by enthusiastic motor boatists.

The **Eagle Company**, of 98 Warren St., Newark, N. J., will occupy spaces 56, 57 and 58, with its line of marine engines. All Eagle engines carry the following equipment: Schebler carburetor, Hyde windlass manganese-bronze propeller, Connecticut coils, full electric equipment and a complete set of drop-forged tools. This equipment is included in the purchase price of each motor. The Eagle Company makes three distinct types of two-cycle marine engines including 18 different sizes, ranging from 1 1/2 to 25 h.p., and having from 1 to 4 cylinders. The line of engines offered for 1912 is as follows:

## HIGH SPEED TYPE.

Light Weight, Jump Spark Ignition Only.

Model	H. P.	Speed	Price	No. of Cylinders
G	2	800 to 1000	\$70.00	1
2G	3	800 to 1000	125.00	2
H	4 1/2	800 to 1000	100.00	1
2H	9	800 to 1000	180.00	2

## MEDIUM SPEED TYPE.

Jump Spark or Make and Break Ignition.

Model	H. P.	Speed	Price	No. of Cylinders
A	1 1/2	600	\$60.00	1
B	3 1/2	600	95.00	1
2B	7	600	195.00	2
3B	11	600	275.00	3
4B	15	600	340.00	4
C	6	600	125.00	1
2C	12	600	235.00	2
3C	18	600	340.00	3
4C	25	600	450.00	4

## HEAVY DUTY TYPE.

Jump Spark or Make and Break Ignition.

Model	H. P.	Speed	Price	No. of Cylinders
F	2 1/2	575	\$85.00	1
(Over 3 1/2 actual H. P.)				
D	5 1/2	450	140.00	1
2D	12	450	280.00	2
E	7	400	190.00	1
2E	15	400	380.00	2

The **American Marine Equipment Company**, 27 Haverhill Street, Boston, Mass., will show samples of the various marine engines and accessories for which it is agent, in spaces 1 and 2. In the Fox engine exhibit, the company will display a 3 1/2 h.p. special, 8 h.p., 14 h.p., 21 h.p., medium duty, 9 to 12, 7 to 14, heavy duty, 24 h.p. and 60 h.p. aeroplane motors. Frisbie engines will be represented by 5 and 7-h.p. single-cylinder motors, 10 and 14 h.p., double cylinder, 12, 25 and 40 h.p., 4 cylinder, and 50 and 75-h.p., 6-cylinder motors. In the Watkins engine group will be seen 2 and 3-h.p., single-cylinder motors, a 6-h.p. double-cylinder, and a 4-cylinder, 12 h.p. In addition to the motor exhibits, the company will show a full line of marine plumbing specialties manufactured by Messrs. Goblet & Dolan. A feature of the display will be the 14-foot racing hydroplane, "June Bug," owned by Oliver Iselin, manager of last year's Harvard crew, which can attain a speed of 31 miles an hour.

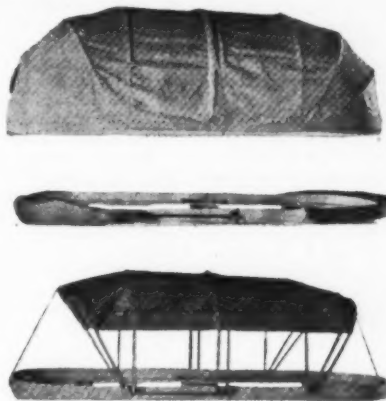
The **Wolverine Motor Works, Inc.**, of Bridgeport, Conn., will have their display in spaces 24 and 25. Here will be found a new 5 1/2-inch bore x 7-inch stroke, 2-cylinder engine, which the company is offering for 1912. In addition, the regular 5-h.p., 18-h.p. and 50-h.p. engines will be shown. Wolverine motors are distinguished by the size of bore and stroke, as compared to the rated horse power, and this will be noticed on the engines exhibited. All except the 5 horse power have a closed base. The reverse gear on all sizes from 12 to 100 h.p. is a reliable spur-gear reverse clutch built onto, and made a part

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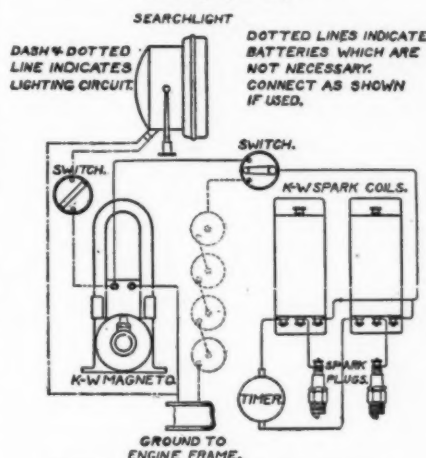
of the motor. The 5 h.p. is equipped with the Wolverine patented reversing propeller, but can be fitted with the Wolverine reverse clutch on special order. The Wolverine ignitor is of the make-and-break type, simple, positive and reliable. All parts are easily accessible for cleaning or adjustment and adjustments are made from the outside of the cylinder. A ring thrust running in babbitt takes up the thrust of the propeller shaft ahead and astern against the frame of the engine. All Wolverine engines have an ignition-changing device by means of which the ignition of the gas in the cylinders can be timed to take place simultaneously in all cylinders at any point desired while the engine is running, thereby giving a maximum amount of power from a minimum amount of fuel. Absolute control at low speeds is a result of the combination of mechanical regulation of the ignition and admission of fuel to the motor. The engines are equipped with a float-feed carburetor, direct connected through the base of the engine with the spark-control lever in such a manner that the control of the speed of the engine and of the fuel supply is embodied in a single lever. As the spark is advanced for higher speed, the supply of fuel is correspondingly increased and vice versa. Wolverine engines without resorting to outside fire, torches, pumps, etc., can successfully be operated with kerosene, gasoline, distillate or alcohol, with a smokeless exhaust and no deposit of carbon in the cylinders. Wolverine Heavy Duty 4-cycle marine engines are built in the following sizes: single cylinder, 5 h.p.; double cylinder, 12 h.p.; 3 cylinder, 18, 27, 36, 50, 65, 75 and 100 h.p.

The K-W Ignition Company, of Cleveland, Ohio, will exhibit its products through its agent, Walter J. Forbes, of 243 Columbus Ave., Boston, in spaces 54 and 60. Among other things will be shown the new special model low-tension magneto for marine engines. This is made in one size only and is belt driven. The construction embodies the well-known K-W principle of stationary-winding and revolving rotor. There are no moving wires, commutator, brushes, or sliding contacts. The only moving part is the rotor, running in high-duty ball bearings. The current is generated in the winding, which stands still and goes direct from the winding to the binding post. The method of wiring the magneto to the coil and timer is exactly the same as if batteries were used. The engine can be started direct from the magneto, fully as easily as on batteries and a two-cycle engine can be reversed on the magneto the same as on batteries. By having a coil for each cylinder the magneto can be used on any number of cylinders and a special K-W coil is furnished with each magneto wound exactly to suit it, thus eliminating the possibility of any coil trouble. These coils are made by the well-known K-W Anhydrous Vacuum Impregnating Process and produce a very hot dynamic spark. In addition to ignition, the magneto operates a 15 candle power bulb, which, when used with a K-W searchlight, gives a 1,500-candle-power illumination that will locate logs and docks a full quarter of a mile away. The K-W searchlight, which is also to be exhibited, is made all in one piece of heavy brass, highly polished, and has a true parabolic reflector of burnished silver of sufficient size to catch all the rays and throw them forward. The reflectors are not spun, but drawn from steel dies, thus giving an absolutely true parabola without the small rings that unusually show on spun reflectors and which, no matter how small, interfere with the proper reflection of the light. The company will also exhibit its regular line of high-tension magnetos,

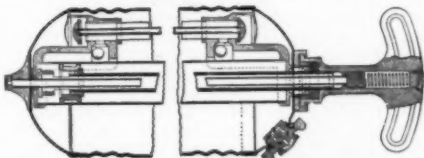
The Pyrene Company of New England, 176 Federal Street, Boston, Mass., will exhibit in space 91. The company is showing this year a new model of their fire extinguisher, which has all brass parts and is made of seamless brass tubing. All the brass and nickel-plated Pyrene fire extinguishers bear the label of the National Board of Fire Underwriters' Laboratories and are approved by the Department of Commerce and Labor for use on steam vessels and motor boats. Pyrene liquid is a combination of powerful gases in liquid form, absolutely devoid of moisture, thus rendering it a non-conductor of electricity. When brought into a temperature of 200 deg. or over, the liquid is instantly converted into a



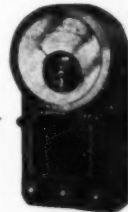
McClellan combination hood (upper) and boat top (lower).



K-W ignition and lighting system.



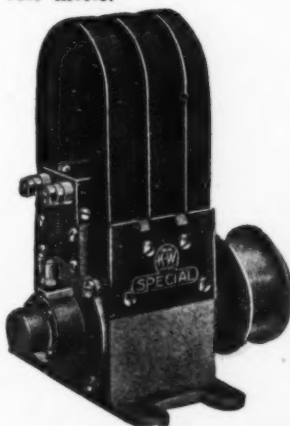
Interior of Pyrene extinguisher.



Motzinger switch and volt meter.



K-W coil.



K-W special magneto.



Pyrene extinguisher.

dense white gas blanket about five times as heavy as air, which, surrounding the fire, destroys the oxygen present and excludes fresh oxygen, thus extinguishing the fire. It will thus be seen that it is very effective on gasoline, oil, benzine and calcium carbide fires, and also conflagrations caused by electricity, and can be directed with perfect safety on a circuit carrying 110,000 volts. It will not freeze at 6 degrees below zero, will not deteriorate, nor explode. If the entire charge in a Pyrene extinguisher is not used, the efficiency of the balance is not impaired. The liquid will not damage the most delicate machinery or material and, being extremely volatile, leaves no residue.

The Burn-Boston Battery & Manufacturing Works, Boston, Mass., will have space No. 13 at the show, where they will exhibit Burn-Boston liquid batteries. A feature of the exhibit will be the display of actual batteries which have been loaned by users and which have run motor boats for two or more years without attention. The slogan of the Burn-Boston Company is "a season's service without battery attention; the only battery which does not deteriorate while standing." The Burn-Boston is made in three sizes: No. 1, (fitting in same space as a standard dry cell) 7½ inches high and 2 11/16 inches for the length and the width, which sells for \$1.25; No. 2, measuring 8 x 3½ inches, at \$1.75; and No. 4, 8 x 4 inches, costing \$2.25. All these batteries have a voltage of 1.5. No. 1 is used for magneto starting and emergency for any number of cylinders, for four-cylinder engines without storage or magneto with the following ignition systems: Atwater-Kent, Delco, Noxon or any coil using one spark per explosion, for Klaxon or any other electric horn, for 1-cylinder, 2 or 4-cycle, or 2-cylinder, 4-cycle engines, etc. Type No. 2 is recommended for 2-cycle, 2-cylinder engines, jump spark, for emergency or any use where long service or heavy discharges are required. It gives 60 per cent. more service than No. 1. No. 4 can be used in general for the same purposes as No. 2 and gives approximately twice the service of Type No. 1. The Burn-Boston battery is a combination of dry and wet cell, which has all the good points of a wet battery with the portable security of a dry cell. It may be kept a year and will be found to give the same number of amperes at the end of that time as when new.

The Buffalo Gasolene Motor Company, Buffalo, N. Y., will exhibit in spaces 70 to 74, inclusive, where the visitor can see 11 of the 20 models which regularly comprise the Buffalo line. The models exhibited will include the 25 h.p. and 40 h.p. auto marine engines and the 60 h.p. high speed model, which is similar in design to the well known 90 h.p. Buffalo racing engine except that it has only 4 cylinders instead of 6. A 9 h.p. heavy duty engine will be shown, which develops its rated horse power at 350 r.p.m. and has a bore of 5 inches and a stroke of 6½ inches. This engine is one of the three new models of heavy duty motors which the company is offering this season, the other two being 85 h.p. and 125 h.p. Besides the 9 h.p., the company will have for inspection samples of their 12 h.p., 26 h.p. and 36 h.p. heavy duty motors. Buffalo engines for 1912 have several refinements which make them an even more desirable motor for marine work than in previous years. Among these might be mentioned an improved arrangement for getting warm air into the carburetor and the addition of a conveniently arranged carburetor throttle control lever. The 25 h.p. auto marine has an extended base which carries the clutch and also the new "positive drive" clutch and disengaging device. The company's entire line of engines is equipped this season with Delco ignition.

Valentine & Company, 257 Broadway, New York City, will show in space 59, samples of Valspar varnish. This is a special type of varnish guaranteed not to turn white when exposed to rain or moisture. It dries over night sufficiently hard to handle and is exceedingly tough. It will resist the action of alkali, acids, oil, etc., and is practically waterproof, remaining brilliant and unharmed, even when continuously immersed in fresh or salt water. If a dinghy is varnished inside with Valspar and allowed to fill with water from a rain, there



## THE BOSTON SHOW

will not be even a water-mark after bailing to show where the Valspar has been immersed. Enamels are also made in various colors, composed of pigments finely ground in Valspar, and are applied in the same manner just as they come from the can.

**The Thermex Silencer Works**, of 9 Lewis Street, East Boston, Mass., will exhibit the Standard Thermex Silencer and the Stream Ejector Under Water Outlet, in space 83. The Thermex Silencer has an unobstructed exhaust inlet of increasing area to a large expansion chamber. Over this inlet nozzle is placed an umbrella-shaped deflector, which discharges the exhaust gases around its edge in a thin sheet. All circulating water from the engine is delivered over the center of this umbrella deflector, from the edge of which the water flows in a thin sheet causing a perfect mixture of water and exhaust gases, thereby reducing the temperature and volume of the exhaust gases to the lowest degree. The umbrella is arranged so that water from the circulation inlet cannot flow into the exhaust passage to the engine. In the process of cooling the exhaust all the odor and solid matter held in suspension in the exhaust is precipitated by the circulating water and carried out through the drain pipe in the bottom of the expansion chamber so that only a slight spray is carried out through the exhaust outlet and the engine is subjected to the least possible back pressure. The stream ejector under water exhaust has the outlet for the exhaust gases shaped in an elliptical annular ring, having a central opening for the flow of a water jet equal in area to the area of the exhaust outlet. The flow of this large central jet, in connection with the flow of the surrounding water, forcibly draws the gas from the outlet, thus removing back pressure. The exhausts are made of bronze and should be located just below the waterline, preferably at the stern.

The exhibit of the **Aristos Company**, of 250 West 54th Street, New York City, can be seen in space 325. Here the visitor will find the company's Mondex muffler. This is made of three pipes of seamless-drawn tubing connecting two expansion chambers. The two outside tubes running the entire length of the muffler are spanned over the heads at each end. The center tube connects the two expansion chambers. The exhaust entering into the muffler through the first tube, travels the entire length of the muffler. At the end of this tube is a series of perforations, circling the entire tube, the sum total of the diameters of which are three times the diameter of the tube. The gas passes through these perforations into the first expansion chamber, then through the center tube to the second chamber, after which it passes through the perforations of the third tube and traveling its entire length, is discharged through the tail pipe into the open air. The mufflers are self cleaning, cannot become sooty or choke up and operate free from back pressure, thereby giving the full power of the motor. The Aristos Company also handles the Disco self starter, manufactured by the Ignition Starter Company, of Detroit, Mich., for use on motor cars.

**The Motsinger Device Manufacturing Company**, of Lafayette, Ind., will exhibit in space 17 B. Of chief interest in this display is the Auto Sparker. This is a dynamo having a flat-faced friction drive with a positive governor, making practicable electric lighting direct from the dynamo, regardless of the variation in engine speeds or fly-wheel sizes. Ignition may also be had at the same time. In addition to the Auto Sparker, the company will show a combination switch and volt meter, which forms an absolutely reliable means of determining storage-battery and dynamo-current conditions. It is simple in the extreme, efficient and inexpensive. The Motsinger D C magneto embodies 15 magnets in each machine, giving an intensely powerful magnetic field so important in a successful magneto. It supplies current revolving in either direction and is furnished with either bevel friction, square end friction or belt drive at the same price.

**Chas. P. McClellan**, of Fall River, Mass., has his exhibit at space No. 9. Here will be shown his Safety Auto Boat Tops, Simplicity Spray Hoods, cushions, etc. The Auto Boat Tops have frames or bows of white oak,

finished and finely polished, with bronze metal slats or bow fixtures attached to them. These fixtures have special locking devices and are positive in operation. These frames attach to and operate on brass slide rods, fastened by special fixtures to deck and washboard. The cover is made of 15 oz. government standard khaki duck, warranted water and mildew-proof. The spray shield or front curtain, side and back curtains are made of 12 oz. duck, as above and all curtains are detachable and well lighted with pyrolin. The McClellan boat top is also made in cheaper grades with 10 oz. duck and 8 oz. duck. The Simplicity Spray Hood is used extensively in open motor boats and in the United States life-saving service. The hoods are made in three styles: A, brass frame, bronze frame end fixtures, brass slide rods, 8 or 10 oz. khaki; B, white oak frame, bow ends, bronze metal, with the wood frame set in these bow ends 3 inches and pinned washboard fixtures, slide rod holders, and slides bronze metal, slide rods brass; C, same as style B, except fixtures are not lever locked, and all fixtures, fittings and slide rods are galvanized iron. McClellan also makes a sliding combination spray hood, which, fitted to both ends of the cockpit of an open launch, makes a complete night cover, and a mellon spray hood. His other specialties are cockpit and deck covers, life preserver boat cushions, fenders, tents, flags and the McClellan Bed Hammock for sleeping outdoors.

**The Pratt Engine and Boat Company**, of 382 Atlantic Avenue, Boston, Mass., will exhibit the following lines of marine motors, for which they are distributors: Ferro two cycle motors, Kahlenberg two cycle heavy duty motors, and Scripps four cycle motors. The Cleveland Auto Boat will also be shown and as a special feature, the boat used by Captain Klaus Larsen on his trip through the Niagara Rapids, equipped with a Scripps motor.

**The Evinrude Motor Company**, of Milwaukee, Wis., will exhibit their detachable row boat and canoe motor. This engine is made in a two cycle high speed type. The Evinrude motor weighs only 50 pounds and develops 1½ H. P. It takes up little room and is easily and quickly attached and detached and is an ideal little motor for row boat, canoe or sail boat. Attached to the stern of a row boat or dinghy, this engine will drive the boat at a speed of from 6 to 8 miles an hour and is perfectly capable of towing a good sized yacht if desired. By the use of the canoe attachment, a very handy little power boat can be made from an ordinary canoe. The motor sells for \$65.00 with fresh water fittings and \$68.00 with salt water fittings.

**The Vim Motor Company**, of Sandusky, O., will exhibit their popular line of marine motors at the Boston show this year and will make actual demonstrations outside the show building. Several improvements have been made in the 1912 Vim, marking a decided advance in two cycle construction. A positive non-backfiring device is embodied in the motor which prevents backfiring absolutely and in addition gives the motor wonderful control and reliability. Another feature is the one adjustment automatic carburetor, the needle point which regulates the flow of gasoline being automatically controlled by the throttle so that the proper mixture is distributed into the cylinders at all speeds of the motor. The air is also automatically controlled by a number of floating balls, thus eliminating the use of a spring-actuated valve. The fly wheels have corrugated rims so that the operator may start the motor by grasping the fly wheel. This improvement does away with starting cranks and eliminates the danger of a kick-back. All Vim motors have been equipped for the installation of a double system of ignition, the Bosch magneto being used in connection with the battery system. Other noteworthy features are a water jacketed exhaust manifold, through which the intake and outlet water passes to and from the cylinder, a small valve being provided for water sufficient to condense the gases to pass into the exhaust pipe, and hand hole plates permitting adjustment of the connecting rod bearings without removal of the cylinder in connection with a spring locking device which holds the adjustment on the connecting rod bearings. The 1912 line includes 20 different models ranging from 3 to

50 H. P. in high speed types for fast runabout and racing boats, medium speed motors for general use and heavy duty commercial engines.

**W. J. Connell**, 555 Boylston Street, Boston, Mass., will show a full line of Schebler carburetors for which he is the New England agent, in space 51B. He will also demonstrate the Pittsfield Spark Coil Company's coils, magnetos, etc., the Detroit Electric Appliance Company's lighting outfits and Edmunds and Jones lamps, which are also made in the Michigan city. Mr. Connell represents these concerns, as well as the Schebler people, through all the New England States.

**The Clafin-Flagg** fog signalling device will be exhibited by J. Walter Flagg, of Worcester, Mass., in space 88. This device is so constructed that the intensity of the sound emitted does not vary, but is thrown in different directions in such a manner that the listener hears five loud and soft blasts, which last about four seconds, thus giving the hearer ample time to interpret them and determine the position of the boat, the direction it is going, its speed and tonnage. The sounds from the device are sent in pre-determined directions relative to the axis of the boat, these directions being aft-port, fore-port, off-bow, fore-starboard and aft-starboard. The distance between each of these positions measures about 60 degrees with a period of time intervening of about one second, making the total time limit about four seconds. This one second interval gives the speed of the boat at about 10 knots. Should the boat be going at a higher rate of speed, the intervals between the blasts will be shorter. At a lower speed, longer. Large vessels will use a whistle of low pitch, medium tonnage, a medium pitch and light craft, high pitch. This is a great improvement over the ordinary method of fog signalling, which is usually done by a whistle or horn blown at intervals of 15 seconds and which does not convey an adequate idea of the direction the boat is going until two or three blasts are heard, which consumes valuable time when two crafts are in dangerous proximity.

**John C. Hopkins & Company**, motor boat outfitters, of 119 Chambers St., New York City, will have on display a Waterbury Wireless Battery Box Holder, which will accommodate any ordinary dry battery. Lights will also be exhibited for the various classes of motor boats. John C. Hopkins & Company make a full line of motor boat and yacht supplies, including spray hoods, motor boat covers, sails, flags, camp outfits, awnings, tents, etc. The company's exhibit will be in space 12 B.

**The Atlantic Maritime Company**, of Boston, Mass., will exhibit the Ejector mufflers made by the Motor and Manufacturing Works Company of Geneva, N. Y., for which they are the New England agents, in space 15.

**The Fairbanks Company**, of Boston, Mass., will exhibit in spaces 94 and 95 their complete line of Victor marine engines in the following sizes: 1½, 2½, 3, 4, 5, 7 and 10 h.p. single cylinder and 7, 9, 11 and 15 h.p. 2-cylinder engines. One of the company's stationary pumping outfits for private water plants will probably also be shown and possibly a larger stationary engine such as would be used by boat builders in driving wood-working machinery and hauling out boats, etc. The Victor engine is a two-cycle, two-port motor, strong in all parts and well-balanced and built for long, hard service. On the single-cylinder engines, glass-body, sight feed oil cups are used to lubricate the cylinder and crank. On the two-cylinder engines, a very complete pneumatic pressure oiling system is used for these parts. Compression grease cups are employed on the main journals of both the single and double cylinder engines. Either make and break or jump spark ignition can be used. The propeller equipment is not one standard design furnished for all styles of boats, whether suited to them or not, but is taken up with the individual purchaser with a view to furnishing the design best suited to his own particular type of boat and the service which is required of it. The 1½ h. p. engine, otherwise known as the "Victor Baby," is of slightly different pattern from the rest of the Victor line. It has a solid cylinder-head phosphor bronze connecting rod and different pattern plug.

# British Gasoline-Kerosene Engines

## No. 3 The Brooke.

By J. Rendell Wilson.

**O**PINIONS differ even in the design of marine oil engines, and contrary to usual British practice of adopting a combination that enables an engine to run on either gasoline or kerosene, Messrs. J. W. Brooke & Co., of Adrian Works, Lowestoft, make a separate series for each fuel. Consequently their gasoline engines are intended only for pleasure launches, racers, cabin cruisers, auxilaries, and small motor yachts, while the slow-running, heavy-duty kerosene engines are specially designed for business craft, such as barges, tug-boats, cargo, and passenger vessels.

With the exception of a little two-stroke 3-h.p. dinghy motor, all Brooke engines are of the four-cycle type, and are turned out in one, two, three, four and six cylinder outfits of from 4 h.p. to 300 h.p. For the purpose of description I will first deal with the three-cylinder monoblock gasoline model, which develops 12 h.p. at 900 r.p.m., and then the single-cylinder kerosene engine, that gives 10 h.p. at 500 r.p.m.

In the gasoline engine, the cylinders are turned out in one casting, a feature now very popular and largely adopted in Great Britain, and are  $3\frac{5}{8}$  in. by  $4\frac{3}{4}$  in. bore and stroke. They are cast in special close-grained iron, and after boring, are ground out dead-true to gauge. Both inlet and exhaust valves are mechanically operated, are interchangeable, and are arranged on the port side, the enclosed cam-shaft being driven by two-to-one spur gearing off the crankshaft, marine engineers not yet having adopted the system of chain-driven cam-shafts. Simplicity, combined with a refinement and accessibility of details, are features of the design, and in addition to the valves being on the port side, here are also the carbureter, water-pump, exhaust branches, and sparking-plugs, while the magneto and starting-handle are placed at the forward end, leaving the starboard side free from working parts. So it will be seen that there is no need to indulge in that game of our youth—"Here we go around the mulberry bush"—around the engine when adjustments

are required. The water-pump, magneto, and starting-handle are all chain driven, while the latter is carried to a reasonable height above the floor-boards so that when starting up the engine one is not likely to skin the knuckles through rubbing against the floor at each turn.

Bosch high-tension magneto ignition is generally employed, and the plugs are fitted in the port sides of the valve chambers, where they are less likely to become splashed with lubricating oil. The leads are carried through an insulated bracket at the forward end of the cylinders to the magneto. When desired, dual ignition is fitted, which, of course, is only a question of adding a distributor, coil, and battery. The water-pump, I may say, is of the eccentric drum type, and is constructed throughout of gun metal. Lubrication is by sight drip feed from a brass oil tank, which is mounted on the control board at the after end of the engine. The carbureter is automatically controlled by a centrifugal governor, which can be cut-out when it is necessary to accelerate the engine. Both clutch and reverse gear are supplied, and the former, which is of the metal-to-metal cone type, is operated by a foot pedal, while the reverse gear is controlled by one lever for the ahead and astern movements. There is a thrust-block in the gear-box. Regarding the fuel consumption, this is about  $9\frac{1}{2}$  pints per hour when developing the rated power. The total weight of the engine clutch and reverse gear is 440 lbs., and with all accessories such as shafting, magneto, pumps, controls, bronze propeller and stern tube is catalogued at £122 (\$610).

It will be seen from the illustration that the kerosene engine while free from complication has no essential features left out in the design, and is thus suitable for working when attended by unskilled hands, as often is the case where barge or fishing boat

traffic is concerned. Electrical ignition has been discarded, and the hot-pot system adopted. For starting purposes a blow-lamp is required which heats the hot-pot (or vaporizer) on the cylinder head, and after the lamp has been burning for about ten minutes the flame can then be switched off, as the engine maintains its own heat under all conditions of load, after it has been running for a few minutes. Fuel is supplied by means of a pump actuated by a cam on the main cam-shaft, and is forced through a non-return valve to the sparying jet in the hot-pot.

To control the engine speed and fuel supply there is a governor which controls a little by-pass valve, allowing excess of kerosene to overflow into the tank instead of being forced to the engine. This by-pass valve may be removed for cleaning by unscrewing one nut only. To the by-pass there is a glass indicator, so that the action can clearly be checked. Lubrication is under pressure from a gear-type pump, which forces the oil first through a strainer, and secondly, through an adjustable relief valve, and thence to the working parts. Having carried out the lubricating operations, it flows to a sump in the crank-case, from whence it is again circulated. As before mentioned, 10 h.p. is developed at 500 r.p.m. For reversing, a combined clutch and reverse gear is supplied, the latter being of the epicyclic type, while the clutch is composed of beechwood blocks compressed between two cast-iron plates, and is operated by means of a sliding cam, which raises two claws, forcing the surfaces together.



The 12-h.p. Brooke gasoline and the 10-h.p. kerosene models. The tendency abroad toward combining the power plant and its accessories in one unit is shown in the lower picture.





**A Sixty-Foot W. L. Auxiliary That Successfully Combines the Advantages of Both the Motor Boat and the Sailing Yacht Without Subordinating Either Means of Propulsion.**

**T**HE auxiliary schooner *Transient* is of a type that will appeal strongly to a great many yachtsmen as she is an unusually successful combination of sail and power.

She is primarily a shoal draft, seagoing craft, as heavily built as a working boat, fast under sail in a breeze of wind and with auxiliary power sufficient to give her a speed of eight knots.

The chief requirements which her owner imposed on her designers, Messrs. Bowes & Mower, were a seagoing boat drawing not over four feet, rigged so that she could be handled by a small crew and capable of a speed of eight knots under power.

The first idea was an adaptation of the Chesapeake Bay bug-eye type, but this was later given up in favor of the Atlantic City fisherman type of schooner with short overhangs and a pole mast rig. The working boat idea has been closely adhered to in design and construction of hull and rig, and the result is a boat capable of going anywhere in any weather.

Below decks she has an amount of comfort seldom to be found in a yacht of her size and her accommodations are so well laid out that in all her quarters there is a comfortable sense of roominess. The power plant is in the stern, cut off from the cabins by a sound proof, water tight bulkhead so that all the objectionable features of an auxiliary are avoided.

As shown on the plans, which are published in the department of designs in this issue, the main cabin is located amidships just aft of the main mast, and is 12 feet long and the full width of the ship. On the starboard side there is a wide extension transom with a side board at the forward end and at the aft end, alongside of the companion way steps is a large

hanging space for oilers, etc. On the port side the transom is carried across the after bulkhead, forming a corner seat for the dining table. There is a side board at the forward end of this transom, the same as on the starboard side. And above the transoms are built-in lockers and shelves for books, instruments, etc.

The owner's stateroom is forward of the main cabin on the starboard side and has a private bath room opening from it. This room is unusually large with a wide double berth, bureau, clothes closet and transom seat.

On the port side is the passage leading to the galley and opening from it is the guest's stateroom and forward of this is a toilet room, accessible both from the passage and from the stateroom. The interior is finished throughout with panelled bulkheads, with white enamel, rubbed to a dull finish, and mahogany trim. The ports are unusually large and ample in number and the skylights are large and so located that there is always plenty of light and air.

The galley is forward, extending the full width of the ship and is reached by a hatch from the deck as it is cut off by a bulkhead from the forecabin. The ice chest is on the starboard side and is unusually large. The stove is a shipmate and there are lockers, dish racks, shelves, etc., to suit the most exacting steward. The forecabin has pipe berths for the ship's crew of four men.

Perhaps the most interesting feature of the boat is her engine room, as it is in its equipment as complete and up to date as is ever to be found on an auxiliary.

As before stated, the engine room is cut off from the rest of the vessel by a double, water-tight bulkhead, with a heavy layer of asbestos felt between the two thicknesses of wood, so

that it is not only water tight, but sound proof and fire proof as well. The engine room is reached by a hatch in the deck on the port side, just aft of her main companion way.

The main engine is a 40-60 H. P. Murray & Tregurtha, with four cylinders,  $7\frac{1}{2}$  in. x 10 in., turning a two-bladed propeller 36 in. in diameter, 375 revolutions per minute. For canal work the engine can be slowed down so that it will send the boat along at less than three miles per hour, and when opened up to her full working load it will drive her along at seven or eight nautical miles per hour. The engine foundations were specially designed and built under the architect's personal supervision, and the entire installation is so well done that there is absolutely no noise or vibration noticeable, either on deck or in the cabins, when under power. The gasoline tanks are placed athwartship, just aft of the engine room bulkhead, and are 5 in number, specially made of heavy copper and are set in a deep copper pan, fitted with scuppers draining outboard. The tanks are above the water line and the space below them is utilized for fresh-water tanks.

In addition to the main engine there is a complete electrical plant, consisting of a  $4\frac{1}{2}$  K. W. direct connected General Electric generator, driven by a four cylinder, four cycle General Electric gasoline motor. The switch board is located on the after engine room bulkhead and the storage batteries are on a platform on the starboard side. She is lighted throughout with electric lights with connections in her cabin and staterooms for electric heaters and fans. There is a separate circuit for her deck and running lights and another for the main feature of her electrical equipment, which is her electrically operated windlass. This is a Providence Yacht Windlass, fitted with a  $3\frac{1}{4}$  H. P. General Electric

motor, located below deck and driving the windlass by a series of bevel gears. She carries a 250 pound anchor with  $\frac{3}{4}$  in. chain and the windlass will bring this home at the rate of 60 feet per minute, while the crew sit and look at it to the envy of their fellow sailor men when the fleet gets under way. When getting under way in a heavy wind and a sea the main engine is started ahead slowly to relieve the strain on the chains so that there is no danger of overloading the motor.

Transient is flush decked with a low bulwark and on account of her shallow draft this necessarily makes her rather high sided, but it gives her a look of ability and power that is rather pleasing than otherwise. Aft the deck is sunk so as to make a sort of cockpit, the break coming just forward of the steering wheel. She carries three boats on her davits, a 14-foot Atlantic power skiff to starboard and a 10-foot dinghy and a sailing dory to port. The main companion way is set off the center

line of the vessel to keep it clear of the main room when the mainsail is furled and just alongside of it is the underwriter pump, which is used for pumping the bilge and also has an outboard suction for washing deck or for use in case of fire.

One little feature which attracts some attention is the Chelsea clock screwed to the after end of the main cabin skylight. It is a great convenience to be able to see the time without going below.

Her spars, rigging and deck fittings all show the practice and detail of the fisherman rather than the yacht and she has gone through the season carrying on sail in all kinds of weather without carrying away a piece of rigging.

For off-shore cruising she is in some respects far superior to the power boat, as sail can be carried to steady her and in a strong breeze she will handle beautifully under a reefed mainsail and forestaysail and she can be put through any kind of a squall by letting

everything go except the foresail.

In light airs she has a big fisherman's main-topmast staysail which lifts her along in fine style, and in a strong breeze she will turn to windward with the best of the keel cruising boats of her size.

She was designed by Messrs. Bowers & Mower, the Philadelphia naval architects, and built under their supervision by the Salisbury Marine Construction Company, of Salisbury, Maryland. She is a thoroughly practical boat in every detail, with no frills and is a credit to her designers and builders.

Her dimensions are: Length over all, 78 feet 4 inches; length water line, 60 feet; overhang, forward, 8 feet 3 inches; overhang, aft, 10 feet, 1 in; breadth, extreme, 18 feet; draft, extreme, 4 feet; freeboard, bow, 8 feet 2 inches; freeboard, stern, 5 feet 10 inches; freeboard, least, 5 feet 2 inches; area mainsail, 1,460; area foresail, 544; area forestaysail, 255; area jib, 295; total sail area, 2,554.

## The High-Tension Magneto.

The Advantages of this Source of Ignition Current Over the Several Other Popular Types and Some Suggestions for Its Installation, Care and Operation.

By J. P. Sadler.\*

FROM its inception the successful operation of the gas engine has depended upon the ignition, and to this particular subject the designer has paid the greatest attention. Consider the improvements that have been made in the last 25 years, from the time that Daimler employed hot tube ignition for his engine installed in the first successful motor boat.

In the early eighties electric spark ignition was introduced on several makes of engines. It was of the make-and-break type and had the contacts in circuit during the complete cycle of operation with the exception of the point where the ignition occurred when the piston hit the movable electrode, broke the circuit and produced a spark within the cylinder.

This system was very wasteful of electric current and was superseded by mechanically operated devices arranged outside the cylinder and which kept the circuit open during the greater part of the cycle. In this system the circuit between the igniter points outside the cylinder was closed only long enough to permit of the proper magnetic saturation of the primary coil, a tapping device being em-

ployed to give a quick action at the time of the break or separation of the electrodes.

Later, magnetos utilizing a primary coil in circuit in order to reduce the cost of operation due to the constant renewal of batteries, were introduced, but the results obtained from these magnetos as first brought out were not to be depended upon.

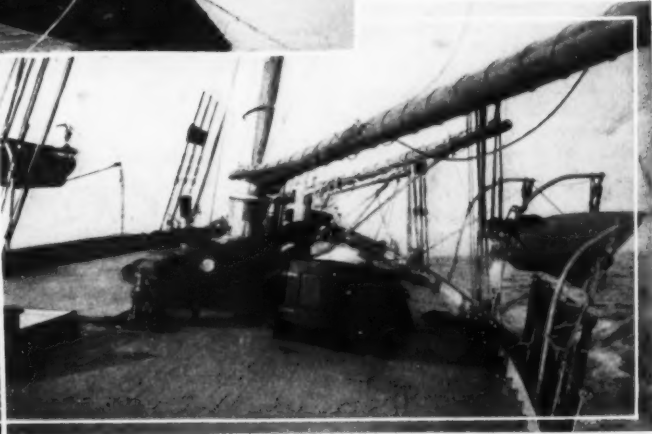
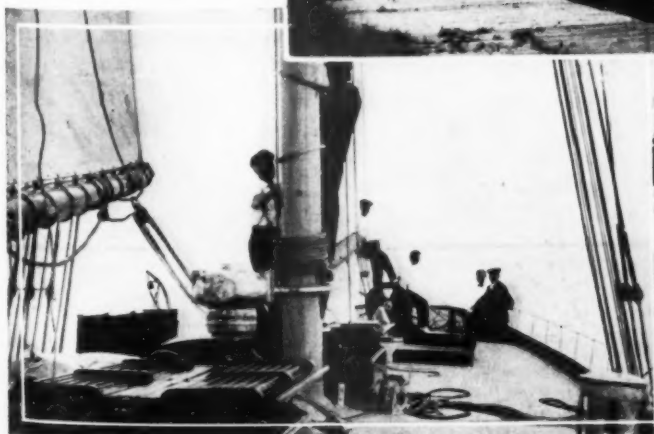
The high-tension, jump-spark ignition, using batteries as a source of current, was next introduced by the marine engine manufacturers, and has gained a strong position in the industry. This system has the disadvantages of renewal or recharging of batteries as a source

of electrical energy.

Undoubtedly the highest achievement in ignition devices has been in the development of the magneto, both of the low and high-tension types, but more particularly the latter. Owing to its extreme simplicity, compactness and the few wires required, the high-tension magneto has rapidly gained in popularity among motor boatmen, and it is encouraging to note that a great number of marine engine manufacturers will supply them as a part of their regular equipment.

The spark produced by a high-tension magneto is hotter than that produced by any other type of jump-spark ignition, consequently more perfect combustion is secured. Contrary to what is commonly understood, the mixture in the cylinder of a gas engine does not explode, but burns with great rapidity. Therefore, the larger, fatter and hotter the ignition spark, the quicker the burning is and the greater the pressure is in proportion to the rapidity of the expansion of the gas caused by the heat generated in burning.

As compared with the low-tension magneto, which like  
(Continued on page 58.)



Transient and views of her roomy deck. Note the powerful bow, high freeboard and comfortable sunken deck aft. See design on page 44.



# THE PRIZE CONTEST IN QUESTIONS AND ANSWERS

**A**T first glance the idea of a fireless cooker on a motor boat seems awfully domestic, but think it over. If the "cooker" is a convenience in the home, isn't it a lot more so on a cruise? Is it not an advantage to be able to heat up a stew, for instance, at lunch time, put it in the "straw box," turn out the galley stove and forget it, with the conviction that a well-cooked dinner will be ready in the evening? Real cooking on a small cruiser is difficult, and oftentimes, while under way in bad weather, it is well-nigh impossible. It is, therefore, frequently slighted, with the result that the frying-pan is overworked, to the detriment of all but the invulnerable digestion. The ideas contained in the answers to the first question thoroughly cover the construction of a fireless cooker.

**C**ANVASED decks and cabin tops are undoubtedly the most satisfactory from almost all standpoints—and the cheapest, but opinions differ rather widely as to the best method of applying the canvas. Read over the several methods and select the one that seems best to you.

**T**HERE isn't much room left to talk about the diagrams and answers to the third question, but look at them, compare them and if you are unable to get something good out of them, you are an electrical expert and not in a class with the rest of us.

**T**HE QUESTIONS FOR THE APRIL CONTEST ARE THESE:

Describe with plan the best exterior arrangement for a cruiser in the neighborhood of 30 ft. O. A., considering both cockpit and deck.

*Suggested by "Cruiser," Milwaukee, Wis.*

**When You Send in Your Answers, state what you will take if you win a prize.**

Discuss the principal woods used in boat building, giving their various characteristics and suitability for various parts, such as planking, framing, finishing, etc.

*Suggested by G. H. L., New London, Conn.*

What is a good, simple and quick method of re-finishing the bright work or varnished parts of the boat?

*Suggested by S. C. Wolcott, Dixondale, Va.*

**A**NSWERS to these questions, addressed to the Editor of MoToR BoatinG, 381 Fourth Ave., New York, must be: (a) In our hands on or before February 25, (b) not over 500 words long, (c) written on one side of the paper only, (d) accompanied by the senders' names and addresses. (The name will be withheld and initials or a pseudonym used if this is desired.) Questions for the next contest should reach us on or before the 25th of February.

**T**HE PRIZES ARE:

For each of the best answers to the questions above, any article advertised in MoToR BoatinG, of which the advertised price does not exceed \$25, or a credit of \$25 on any article advertised in MoToR BoatinG, which sells for more than that amount.

(There are three prizes, one for each question, and a contestant need send in an answer to but one, if he does not care to answer all.)

For each of the questions selected for use in the next contest, any article advertised in MoToR BoatinG, of which the advertised price does not exceed \$5, or a credit of \$5 on any article advertised in MoToR BoatinG, which sells for more than that amount.

For all non-prize-winning answers published we will pay space rates.

## Making a Fireless Cooker.

**This Extremely Useful Culinary Convenience Adapted to the Conditions of the Cruiser.  
The Possibilities of the "Strawbox" as Part of the Galley Equipment.**

*THE PRIZE CONTEST—Answers to the First Question in the December Issue.*

### Use a Locker.

*The Prize Winning Answer.*

**B**UILD your fireless cooker in one of the lockers under the seats. Details must be worked out by individuals in accordance with space available, but here are general rules of construction. Paper wadded into a crumpled mass, excelsior, chopped hay or straw, dried leaves, cotton batting, curled hair from an old mattress, dry sawdust or shavings, old woolen cloth or any such non-conductor of heat which may be packed so as to be full of very small air-spaces, may be used for packing. Asbestos or other paper like heavy wrapping paper or building paper will also be needed. The kettles should preferably be of aluminum, which cannot rust, but enameled ware will do just as good work as long as it lasts. The lids should be very close-fitting.

Line the drawer or locker space with the asbestos or paper, then place the packing to the depth of three or four inches over the floor of the space. Press down firmly, then set your kettle or kettles on it so as to leave about three or four inches space between and around them. Put packing in

firmly around and between them till level with rims. Take out kettles and line holes left with asbestos or other paper, covering top of packing smoothly with same, to prevent packing from getting into food. Make pad thick and long and wide enough to fill remaining space, filling it with the packing, allowing for opening and shutting if it is in a drawer. Cover pad with clean cloth, an old pillow case being

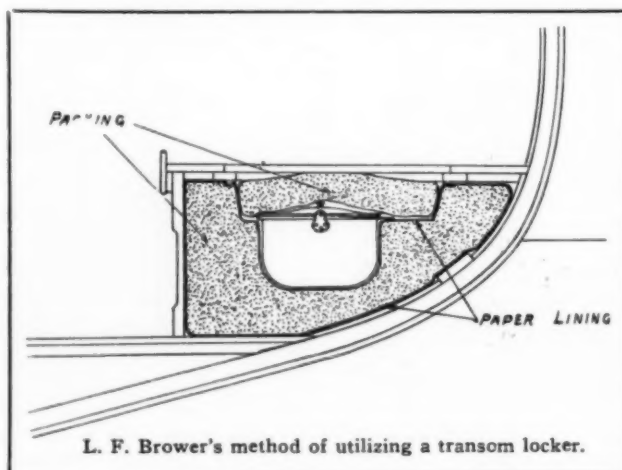
good, or a pillow may be used instead of the pad. The food cannot get any of the odor of the packing if the covers are tight. Of course, asbestos wool is the most desirable packing, but is expensive.

Bring the food to a brisk boil, set kettle into "nest," cover with pad, shut drawer or locker lid, and your dinner cooks while you sit on the cooker and wait, or go about any pleasure or business that you wish. Potatoes require two hours, if small. Macaroni, rice, cereals, vegetables, soup, meat, fish, fowl, dry vegetables or fruits, tapioca, Indian pudding or any bag pudding besides other things that you will discover by experimenting, are really better cooked slowly by this method than over the fire, with no possibility of burning.

L. F. BROWER,  
New Britain, Conn.

### How to Build a "Straw Box."

**F**IRST procure a wooden box about 16 inches square, of sufficiently strong construction so that the cooker may be



L. F. Brower's method of utilizing a transom locker.

used as a seat. Two granite stewing kettles with well-fitting covers will be necessary. One of these should be 12 inches in diameter, 14 inches deep and should have perpendicular sides. The other kettle should be about 11 inches in diameter and 10 inches deep, so that it will easily fit into the larger kettle, allowing space at the bottom for a stone or brick which may be heated before the food is placed in the cooker. Place the larger kettle in the wooden box and pack hay lightly around and under it. Make a cover for the box and cut a hole in the center about 12 inches in diameter, so the smaller kettle may easily be placed in the larger one. This cover may be nailed in place and the piece which was cut out of the center may be kept to close the opening.

The box may be painted or stained and varnished to match the woodwork of the boat. A cushion will help to keep in the heat and complete the cooker as a seat.

Mrs. H. B. V., Chicago, Ill.

### A Complete Cooker.

**I**N making a fireless cooker for a boat, several factors must be taken into consideration:

First, determine the capacity. This may be one quart or more.

Second, make the cooker small enough unless the room is unlimited. An octagonal box with perpendicular sides is best. (It is smaller than a rectangular box, and easier to make than a cylindrical one.) When several compartments are wanted, several separate cookers are preferable to one large one because more readily stowed.

Wool, mineral wool, ground cork, hay, paper or excelsior may be used as heat insulators. If the first three, tightly packed, are used, only about two inches—not less, preferably more—need be allowed on all sides. Allow twice as much for the other insulators.

A pail about as high as wide and having a tight cover is best in which to cook foods. Pails specially constructed for use in fireless cookers can be purchased.

Make the box at least  $4\frac{1}{4}$  inches deeper than the pail is high (if using the best insulators). Half-inch stock is heavy enough for its construction. In making an octagonal box, make the bottom first. This saves figuring the width of the sides. Lay out the bottom by drawing on the board a circle with the radius equal to radius of pail plus thickness of packing plus one-eighth inch. Circumscribe an octagon about this. Then saw and plane to the octagon. The width of a side piece is  $\frac{3}{4}$  inch greater than a side of the base. Plane the edges of the sides to 45 degrees and screw together as in detail drawing. Lay out the cover the same as the base, but use a radius  $\frac{7}{16}$  inch greater. Around this make a rim  $\frac{3}{4}$  inch wide from quarter-inch stock. The pieces are  $\frac{3}{8}$  inch longer than a side of the cover. Plane the ends to 45 degrees and put together like sides. It is better to brace the cover with a strip of quarter stock running across the grain, inside. Attach some fastenings to hold the cover down; window sash locks will answer.

The cooker may be handled more easily if drawer pulls are fixed below locks. Before packing the box, line it with two layers of building or asbestos paper. Make a tube just large enough to slip over the pail and as high as the pail plus the thickness of packing. A strip of the building paper rolled and fastened with glue will do.

Stand the cylinder on end in the center of the box and pack the insulator around it tightly. Fill the bottom to the required depth when packed down. Now line the cooker with duck or other strong material. Make a cushion to completely fill the remaining space, from the same material filled tightly with the insulator. This is best made like a small octagonal box-mattress and  $\frac{1}{4}$  inch thicker than the space above the pail.

The cooker is now ready for use.

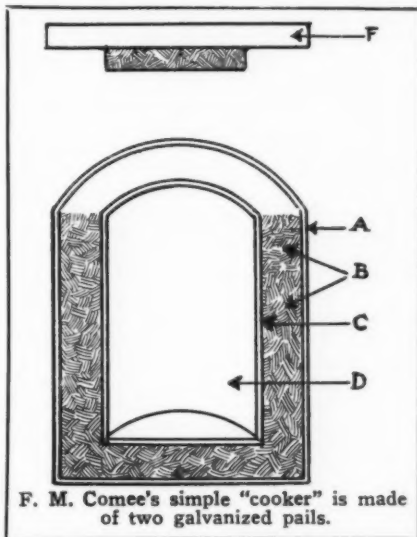
HOWARD E. FIELD, Willmette, Ill.

### Easily Constructed.

**T**HIS fireless cooker may be built to order by the local tinsmith or made out of two different sized galvanized pails which are to be found in all hardware stores. Perhaps the best understanding of it may be given by simply describing the sketch.

A is the outer can or cylinder.

B is a non-conducting filler. An asbestos filler is the best to use here, but other things



such as hay or straw packed close, ground cork, sawdust, etc., have been used with good results.

C is the inner can or cylinder. In this the food to be cooked is placed and supports for a shelf or shelves will be found to increase the capacity of the cooker.

F is the filled cover for the outer casing. A tight fitting cover for the inner can should also be used.

A fireless cooker is particularly handy for short day trips as it enables one to have a hot dinner whenever the appetite is sufficiently sharpened without waiting for it to cook.

F. M. COMEE, Cambridge, Mass.

### A Cooker with Radiators.

**P**ERHAPS the ideal of a fireless cooker for motor boat use would be one with vacuum insulation. Its advantages would be its high efficiency, lightness and compactness. Vacuum bottles make good cookers on a small scale, but their size is so restricted as to make their usefulness quite limited. For some reason it is apparently impracticable to make these bottles or jars larger than the quart size. My experience has been that these often come in quite handy, but are very easily broken. The jar especially is quite useful for cooking cereals, fresh vegetables, etc., in small quantities. The other objection to these is their cost, which is considerable. I have had no experience with bottles with metal vacuum jackets, but understand they are not as efficient as those using glass.

For a fireless cooker of the regular type the box should be quite tight and with as few joints as possible. Our cooker is made of  $\frac{5}{8}$ -inch hard wood, one piece to a side, dove-tailed together at the four vertical edges. "Double locking" dove-tailed joints are best because they never spread. The size of the box depends on the size of the pail it is to hold. There should be at least four inches of packing below the food container and five or six inches should be left at the top. The best packing is wool, which can be obtained at woolen mills and certain other places.

The food container should be cylindrical in shape and have a tight fitting cover. Aluminum is about the best material on account of its non-corrosive qualities, ability to stand abuse, etc.

To pack, first line the box well with two or three thicknesses of asbestos or heavy paste-board, and pack in the bottom a uniform layer of the insulating material about four inches deep. Set the pail in the middle and pack down firmly all around it. When the material has reached the top of the pail pack it down tightly and lift the pail out. Smooth out the hole thus formed and put in the lining the shape of the pail, to cover the packing at the top. This may be made of galvanized iron, cloth or paste board, preference in the order named.

The best cookers are those using "radiators." These may be simply old stove lids or similar pieces of cast iron. If the cooker is metal lined, put a few pieces of asbestos in the bottom. When using the cooker place a "radiator" heated to at least 300 degrees in the bottom. Then put in the pail and put another "radiator" on top. Cover the whole with a mattress shaped pad of the insulating material, which should fit tightly into the box, and fill tightly the space between it and the cover. Protect it from the top radiator by means of asbestos, etc. The cover should be fitted with substantial hinges and a hasp, and should close the top tightly.

J. T. L., Worcester, Mass.

### Used Earthenware Jars.

**P**ROCURER two one-gallon earthenware fruit jars with large mouths. These are about ten inches high and seven inches in diameter. Make a box of three-quarter inch stock, two feet long, one foot wide, and one and one-half feet deep, inside measurements, with a tightly fitting hinged cover. A lock should be so placed on the box that it will draw the cover down to a tight fit. Line this box with heavy strawboard. Do not make the joints at the corners as this will allow considerable heat to escape. Then place a partition cross-wise through the center, making two nearly square sections.

Place chopped hay or straw in the box and pack it down to a depth of four inches. Now make two cylinders of strawboard ten inches high and large enough to permit the jars to slip in easily. Place these in the centers of the squares and pack chopped hay tightly around them. Cut two squares of strawboard with holes in the center the diameter of the cylinders. These squares should have lugs on all four sides which are bent up and tacked to the sides of the box to keep them in place.

Now make two pillows slightly larger than the remaining space in the sections. Stuff these with hay so that the cover will compress them slightly when shut. Finish the box in a stain to harmonize with its surroundings and the cooker is ready for use.

The cooking schedule of the commercial fireless cooker applies to this one and a copy of this schedule can be obtained from almost any dealer in "cookers." If the jars are warmed before placing the food in them it will aid the cooking considerably.

RALPH A. SCOTT,

Melrose Highlands, Mass.

### The Simplest Device.

**A** FIRELESS cooker can be readily constructed by any one from the following description: Secure a well-made box about 15 inches square inside, by 18 inches deep, provided with a hinged lid with fastener. Line this box with asbestos felt on the sides and bottom and the lid. Prepare some pads, constructed similar to pillows, and stuffed with dry straw, to about 4 inch thickness; one for bottom, one for top, and a long, narrow one to go around the sides. A nine-inch diameter can provided with an airtight lid, about a foot deep, will be required. Several cans can be used, placed one above the other, if desired. This can is wrapped with the long, narrow pad and put in on top of the bottom pad. The upper pad is put in and the lid clamped down. Since space is generally valuable, some locker pads.

L. R. KELLY, Philadelphia, Pa.



# How to Canvas a Deck.

The Most Durable and Satisfactory Deck Covering and How to Apply It.  
Descriptions of Successful Methods Now in Use by Boat Builders.

THE PRIZE CONTEST—Answers to the Second Question in the December Issue.

## A Watertight Deck.

*The Prize Winning Answer.*

**I**N the first place the deck to be covered should be properly laid and fastened, and the very common mistake of leaving it rough and unfair "because it will all be covered up" should be avoided. Neither should matched stuff be used having beading on the upper side as well as underneath, as this beading always shows through the canvas in the form of parallel stripes, completely spoiling the appearance of the deck. The planks should be laid with close seams on top, planed off fair and then sanded down with coarse sandpaper. This gives a surface that can be successfully covered without showing wrinkles, slack places or ridges.

Choose canvas of a width sufficient to cover the deck in one piece with enough left over to turn down around the edges. Eight-ounce duck is the best weight for average work. Draw a center line down the middle of the piece and it will assist you in stretching it evenly over the surface. Copper tacks should be used for fastening the canvas round the deck edges and openings for hatches, skylights, etc. Do not cut out for deck-openings until the canvas is on and fastened, as the holes will tend to make the canvas draw unevenly and wrinkle.

The usual method of fastening the canvas to the deck is to paint the surface to be covered thickly with "all the old paint in the shop," mixed together to about the consistency of molasses; then to stretch and tack the canvas down very smoothly and tightly at close intervals with copper tacks, keeping the center line on the canvas over the center line of the deck. It should then be rubbed down hard all over to insure a perfect contact and when dry, if the job has been well done, it will lie smooth and present a neat and shipshape appearance. Jeffrie's marine glue No. 7 is sometimes specified for this purpose and is applied to the deck hot with a brush, and when the canvas is stretched and tacked in place it is ironed down with a hot flatiron to cause the glue to sweat through the covering. Varnish is also used as an adhesive by many boatmen and seems to work well though no better than the other mediums mentioned.

Painting the canvas is an important part of the process since it is the paint that renders the deck waterproof and perfect waterproof qualities are the crowning glory of a canvas-covered deck. The old sailor will tell you that a canvas deck will never crack if it is wet with sea water before applying the first coat of paint. And this first coat of paint, by the way, should be largely linseed oil with but little lead. Other coats may be made up with less oil (for it will take four or five coats to fill the canvas properly) and a final color that is usually satisfactory is a certain "tan" color that was popularized by the vessels of our navy upon stacks, masts and superstructures in the days before they wore their "war paint" every day.

Half-round oak mouldings should be sprung around the sheer of the boat or the edge of the cabin top to cover the tack-heads and the raw edges of the canvas and these should be fastened with brass screws counterbored and plugged, since iron fastenings will streak the boat's paint with rust every time it rains or the decks are washed down.

A canvased deck properly laid and covered is neat in appearance, easily kept in condition and is what many "calked and payed" decks are not—absolutely watertight. It is also inexpensive and its construction is easily within the ability of the average amateur.

A. O. G., Portland, Me.

## Recommends 8 oz. Duck.

**L**ET us assume that a deck is to be covered with canvas to stop leaks. First, be certain that the wood is sound, for rot is likely to cause trouble later. Smooth the planking with sandpaper and putty all inequalities after high spots have been scraped or planed. Remove the half-round finish strip that covers edges of plank and deck. If there is a quarter-round where cabin trunk and deck meet, take it off. These "beads" may be saved by careful handling, and replaced.

Suitable duck for the cover may be had in all widths. No. 8 is heavy enough. Having dusted the deck apply a heavy coat of paint with a little varnish mixed to secure sticky properties not found in boiled linseed oil alone. Stretch the duck tightly by first tacking it to the cabin trunk or coaming joint, as close up to the angle as possible. Pull the material over the stem and tack; follow same treatment along the sides, using the tacks sparingly because slack must again be taken up.

Cut out all hatches or other openings and rack duck in the angles with an inch or so of the material up against the structures, as precaution against leaks. With everything thus fitted, pull out all wrinkles, using a tackle and blunt pinchers to get a good grip. Be certain that the tackle does not stretch the duck unevenly and damage the warp. Then cut off the duck not needed, leaving a few inches all around the sides till final finish is put on.

Moisten the duck with a sponge just damp with water which will prevent the material absorbing paint too greedily. Apply two light coats of paint, preferably lead color and mostly raw oil. Brush it in hard so the duck will adhere to the under coat, forming a bond between deck and cover. Should wrinkles appear after the paint has dried remove tacks where the loose places show and restretch. Put plenty of paint behind the duck at all contact angles, then replace the quarter-rounds and side beading, trimming off superfluous duck with a sharp knife. Don't try to finish till all tendency to stretch in the duck has disappeared.

Should it be necessary to cut the duck down around a samson finish the job by tacking a piece of thin sheet lead over the joint; the lead will fit snugly, look well, and prove watertight. Don't paint too heavily; too much paint will crawl and crack. A third coat, perhaps a reddish buff, will complete the job and should last several years with an occasional washing to remove dirt and brighten the color.

In covering an old cabin house follow the same directions as given for a deck. Perhaps it would be better to buy or make new beads for the finish. A little extra time spent in removing the skylight will pay and, if possible, take off the companion slides so the duck may be stretched fairly over the top. Cut out the openings, leaving an inch or so of the duck to be turned up inside and covered, later, with face pieces. Most cabin tops are a trifle wider than the trunk, projecting perhaps a half-inch. The top has a filling piece under it, say two inches wide. At the joint between top and filler a half-round bead should be placed to cover tacks in the duck and help the looks of the job, architecturally.

Some builders use a marine glue to secure the duck to deck and cabin top. This glue, purchased by the pound, is applied with a brush and the duck is made to adhere by going over it with a hot flatiron. A canvased deck ought to last as long as the boat if it is painted sparingly and all rough places in the planking liable to cut through the duck are removed.

G. S. H., Boston, Mass.

## Paint Canvas While Wet.

**T**HE most essential point to be considered when covering decks, etc., with canvas, and one that must be adhered to to secure not only appearance but also service, is to be sure and have the surface on which the canvas is to be laid perfectly smooth. If any rough spots are left they will not only cause unsightly wrinkles but will cause the canvas to wear through at this point long before the other parts show any signs of service.

While there are many ways of laying canvas and many different preparations for this work alone, the following method has been used on ships from early times. Select a good quality of canvas, a sufficient quantity of galvanized tacks to tack at least every half-inch, and enough thickly mixed lead and oil to spread all over the surface to be covered with canvas. In laying the seams the laps should be laid from the water, that is, if the seams run athwartships begin aft and work forward, lapping the second cloth over the edge of the first, and if they run fore and aft begin amidships and work outboard on each side, lapping from amidships to side. This is done to prevent the inrush of the water getting under the edges, on the same principle as shingling a house. Apply a heavy coat of the lead and oil and lay the canvas on it smoothing it out and tack securely. After all of it has been laid wet, thoroughly shrink and apply a thick coat of the lead while the canvas is still wet and, when this has dried thoroughly, two or more coats of the color desired may be applied allowing sufficient time for each one of them to set firmly before applying the next coat.

This should give a good waterproof surface and will also make a bright and clean finish to the decks or housings on which it is used, which may be kept clean by a liberal use of soap and water. It may be freshened up as required by an additional coat of paint, and while it should last for years can very easily be renewed if required.

CHAS. MCILROY, New York City.

## Lays Canvas in Varnish.

**I**N the first place be sure the deck or cabin roof is smooth, and that there are no high places caused by the boards warping. If any of the edges seem to be turned up they should be planed down, otherwise the canvas will have a tendency to cut.

Do not make a mistake and buy canvas that is too heavy. Six or eight-ounce duck is just right and after several coats of paint will be hard yet flexible. This light duck can be purchased in various widths up to 10 feet, so few or no seams will be necessary. If you find you must have a seam make it a "lap" seam and be sure it is triple-stitched. The lap should be at least one inch wide.

Prepare the canvas by giving it one or two coats of "size." This is made by dissolving four ounces of glue in one gallon of boiling water. When thoroughly dry, the canvas is ready for laying.

Clean the deck, or cabin roof, and remove any dust or shavings that may have collected in seams or corners and give it a good, heavy coat of varnish. White lead and oil may be used, but from long experience I find the varnish gives more satisfactory results. While the varnish is still wet spread the canvas. Clamp two thin pieces of wood, on either end, using common carpenter's hand clamps and fasten in a light tackle in a secure manner and heave tight. With this method the canvas is well stretched and must lay smooth.

Start tacking one end by bending the canvas

down over the edge, using copper tacks, if possible. Galvanized tacks may be used if unable to secure copper ones. Do not space them more than one inch. If the deck coaming is in place tack the canvas snug to the deck, leaving the edge turned up against the coaming, and after giving it a thick coat of varnish fasten the quarter round into place with braces.

Be sure the paint used on the canvas is very thin and use only the best white lead, oil, turpentine, and the necessary coloring material. When the first coat is dry, go over the canvas with fine sandpaper. This will remove the fine fuzz raised by the first painting and give an unusually smooth appearance. Give the canvas at least three coats of paint, always having it thin. CAPT. R. C. DEMARY, Hancock, Mich.

### An Elastic Finish.

**P**REVIOUS to the actual work of laying the canvas, the surface to be covered should be well cleaned and a coat of paint applied. When the paint is dry, be sure to fill up all cracks, etc., with putty so as to have a smooth surface. Next apply another coat of paint, and do not have any japan in your paint for this second coat, as you desire this coat to be slow drying, because the finish to be put on the canvas when spread is slow drying.

Immediately upon applying the second coat and while the paint is still wet, you should spread and lay your canvas. To assure the best results you should buy your canvas in one width sufficient to cover the entire surface. This can be done in most cases as canvas is manufactured in widths up to 144 inches and number eight or eight-ounce canvas is the proper weight.

The canvas now should be drawn tight, and fastened if on decks to the edge of the deck top covering. This will permit you to cover these fastenings with your rubbing streak and makes a finished job. It might be well to state here, that only copper tacks should be used as others will rust and cause trouble the first season. If a trunk cabin is being covered put fastenings so that a small half-round running on top edge of house will cover them.

Now we have the canvas laid and ready for the final finishing and the best finish is not a hard, brittle finish, but an elastic and pliable one which will not crack and split if dampness gets into the woodwork. To get this elastic finish, take a half-bar of common yellow soap, and cut into small pieces. Melt the soap and when in a hot liquid form, pour into your paint. The proportions should be one-half bar soap to two quarts paint. Stir the soap into the paint well, and apply two coats as thin as possible. You will find that the soap gives a finish to your canvas, which is elastic, pliable and waterproof, and not the hard, flaky surface which results from the application of common paint.

E. FRANCIS ENOS, Salem, Mass.

### How to Use Marine Glue.

**I** THINK that applying the canvas with Jeffries Marine Glue is preferable to any other method. Canvas laid in paint will sometimes wrinkle badly, and if laid dry, it will be found difficult to locate a leak as the water will travel some distance between the canvas and planking before finding its way into the cabin.

Canvas may be obtained of any ship chandler or motor boat supply house in widths up to 120 inches and possibly wider, which makes it possible to cover decks on most small cruisers with one piece. Buy the canvas a few inches wider and longer than the roof or deck to be covered. Use either the No. 7 soft glue or the liquid glue. I have always used the soft.

Apply the glue, after heating as instructed on can, with a very stiff brush. The stub of an old whisk-broom makes a good brush. Have all hatchways and other openings finished as to size and be sure the deck is planed up perfectly smooth as lumps will show through the canvas very distinctly. Start at the after end of cabin and glue a space about three feet wide and the whole width of roof. Have canvas rolled up tightly on a stick and unroll on the glued section, leaving a couple of inches hanging off, which tack to the outside edge of roof using No. 8 galvanized tacks spaced about two inches. Be sure that no loose threads get under the canvas or they will make unsightly ridges.

Iron the canvas with a moderately hot iron till the glue sweats through and tack edges same as on after end. Repeat operations until entire roof is covered. It would be well to paint the canvas once before putting on the hatch frames. Use deck paint, applying freely, and rub in with a small piece of waste. Rub until the pores of the canvas are completely filled and wipe off any excess paint. This will give an absolutely smooth surface and does not appear to injure the canvas as I tried this method out on a canvas-covered dinghy which, after three seasons turned bottom side up on a cabin roof, seems to be in good condition. Of course, it has had several coats of paint in the meantime. Another dinghy painted in the ordinary way at the same time, is still rather rough, so I think that the rubbing is a good way if looks are any object.

Apply hatch frames and cut out the canvas leaving a 3/4-inch strip all around, which turn up and tack to frames. Cover this strip with a thin piece of wood about 3/4 x 1 1/4 inches with rounded edges. This makes a good watertight job. Apply hook-shaped molding to outside edge of roof and varnish the inside edge of molding before putting on. This will prevent the water being stained by the raw wood and staining woodwork as it runs down. Half-round molding may be used, but hook-shaped is better as it prevents

water streaming down over cabin sides. Putty any open places between roof and molding and give roof a final coat of paint. Edges of canvas may be trimmed either before or after moldings are put on. Run a sharp knife along the lower edge of moldings, the little cut in the wood will not show with the overhanging edge. If the work of gluing and ironing the canvas is carefully done the roof will be perfectly smooth and a joy to its owner.

EDWARD E. HEERMANCE, Hudson, N. Y.

### Thick Canvas Desirable.

**A** WOODEN deck that is to be covered with canvas must be perfectly smooth and supported by enough deck beams so that it will not give when walked upon. Having obtained a smooth deck, give it a coat of thin paint, being careful not to leave any brush hairs or lumps of any kind. Putty will not stick to bare wood so be sure that paint gets into the nail-holes where the nail-heads were set.

In the case of a forward deck commence at the stem and turn the canvas under for one or two inches and tack securely with long, copper tacks spaced about one inch apart. Do not use galvanized or copper-plated tacks as the coating will crack and rust stains appear. Having fitted and tacked the canvas at the stem, next pull it tightly and put in a few tacks at the after end of the deck in a direct line between the stem and the stern. Place these tacks so that they will be covered by the half-round strip or coaming that forms the finish at this point. Now pull tightly and tack the canvas on each side of the stem for about two feet aft and then pull and tack on the after side as before. Repeat this process until the entire deck is covered.

Paint the canvas before putting on the half-rounds, carrying the paint clear to the edge of the canvas. White lead and linseed oil make the best primer and the canvas should be wet with salt water before painting the first coat, as it will then take up much less paint and wear just as well. A broom can be used and the water "swept" on.

The color desired should be in the last two coats applied, and "smokestack buff" (used by the Government on tugs and tenders) seems to be the popular color. This you cannot buy ready-mixed, but you make your own by the addition of scarlet vermilion and burnt umber, ground in oil, to the base of lead and oil you have been using as a primer.

If there is to be much walking on the deck obtain the thickest canvas possible. The best I have used I obtained second-hand from a paper mill where it had been used as an endless belt on which to dry paper. The mills discard this canvas as soon as it frays at the edges, but it is still good for decks.

THOMAS HALL WYATT, Boston, Mass.

## The Electrical Equipment.

### Methods of Arranging the Principal Parts of the Electrical System and Suggestions for Wiring Both the Ignition and Lighting Circuits.

THE PRIZE CONTEST—Answers to the Third Question in the December Issue.

**I**N laying out an ideal system for the electrical equipment of a motor boat, it is essential first of all to decide just what is to be operated of an electrical nature in addition to the ignition outfit. If a searchlight or other lighting is wanted, a storage battery will be required, in which case a set of dry cells should be provided for emergency use.

To overcome the trouble of recharging the storage battery, it will be advisable, if the size of the launch will permit and the owner's purse does not rebel, to install a dynamo or generator to do the charging automatically. A number of generators are on the market arranged for connection by belt, friction pulley, or otherwise

### A Complete System.

The Prize Winning Answer.

to the engine flywheel or propeller shaft, and equipped with an automatic cut-out which disconnects it from circuit, except when running.

The switchboard should be located within convenient reach of the man at the wheel, and should contain, if possible, all switches and instruments required. It may be of hardwood, neatly polished, or of slate. All switches should be selected of substantial rather than flimsy design.

The wiring should be done and all connections made in such a manner that if trouble should at any time arise it may safely be as-

sumed that the trouble is not in this part of the work. All wire should be rubber-covered and in no case should ordinary "bell wire" be used. All joints should be soldered, then well taped, and finally given a coat of asphaltum or weather-proof paint. Metal staples should be avoided and either wooden or porcelain cleats used to fasten or support the wires, or they may be neatly run in wood moulding.

The size of wire to be used will depend largely on the amount of service to be supplied and length of the circuits, but nothing smaller than No. 12 or No. 10 "B and S" gauge copper wire should be used for the generator, storage, and dry battery feeds, while No. 14 wire will be best for the circuits. Individual leads to



each lamp or other device, if short, may be of No. 16 or No. 18 wire.

If available, two-conductor lead-covered cable will form an ideal feed for the generator and batteries and for the circuit to the ignition outfit. These cables are impervious to moisture and may be run safely through the bilge or other damp places. In using, cut away some of the lead covering on each end exposing enough of the wire to make connections, then treat the ends with cable compound or tape and paint to keep out moisture.

The storage battery should be located near the switchboard on a substantial shelf and be connected to the switchboard with No. 10 doubled braid rubber-covered wire.

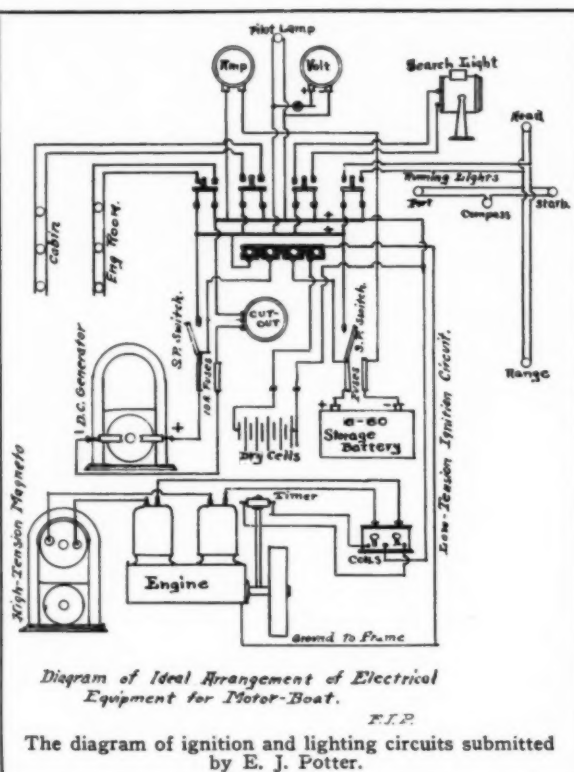
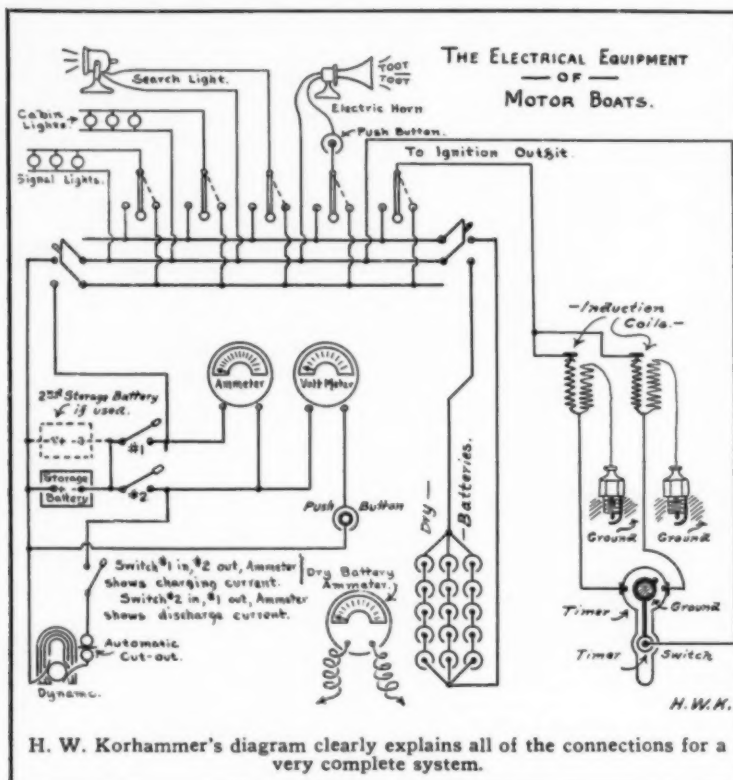
The generator should also be connected with this size wire run in enameled or fiber-lined conduit from the engine to the switchboard.

The switchboard should be located as near the engine as convenient and should be of marble or slate with all instruments, switches, etc., back-connected. Both generator and storage battery are protected by 10-amp. cartridge

proof moulding or circular loom. Wires from coil to timer should be strong, flexible, rubber-covered and protected by conduit where exposed to abrasion on engine frame, etc.

Coils on cylinder are preferable, but if box coil is used it should be placed as close to engine as possible without being in the way. Secondary or high-tension wires from coils and high-tension magneto should be best wire made for the purpose and run in fiber-lined conduit with hard rubber outlets.

E. J. POTTER, Trinidad, Wash.



The dry cells should be placed in an air-tight and waterproof box. These are for emergency use only and lights should not be operated on them except in extreme emergency. A permanent testing ammeter mounted near the batteries, with flexible leads of sufficient length, will be found very convenient.

Tungsten lamps should be used throughout and should be of as low a wattage as will give enough light, in order to reduce the drain on the storage battery.

The system above outlined, and as shown in diagram, modified to suit individual needs, should give satisfaction in small or medium-sized launches, and should give very little trouble and require very little expense for maintenance.

H. W. KORHAMMER, St. Louis, Mo.

### Reliability Uppermost.

IN the equipment here described, unflinching reliability of ignition is the main consideration. This is obtained by the use of the well-known generator storage system and a high-tension magneto sparking a separate set of plugs.

The generator for the storage system should be a dynamo or direct current magneto, preferably built on the engine and driven by gears with a clutch for disconnecting when not in use. It should be of a size sufficient to charge steadily a 6-volt, 60-ampere storage battery at the highest rate recommended by the makers. For a 6-60 battery this would be about 7½ amperes, but the generators will not often be called on to deliver this much current as the battery "floats on the line" receiving or giving out current according to the demand at the switchboard.

fuses, and the positive side of each is permanently connected to the positive bus-bar, the generator being connected through an automatic cut-out which protects the battery from discharging back through the generator when same is stopped or running slow. The negative sides of both are connected to the negative bus-bar by single-pole knife switches. The cabin, engine-room, searchlight and running lights are on separate circuits and may be turned on or off at will by means of double-pole knife switches without interfering with the ignition circuit. By means of a plug and the four sockets shown the ignition current may be taken from the bus-bars or independently, with all switches out, from the generator or storage battery, or as a last resort, if the storage battery is completely discharged and both high and low-tension magnetos out of commission, from a set of dry cells by simply moving the plug from left to right sockets in the order named.

By a combination of this plug switch and one of the two single-pole knife switches the ignition current may be taken from the generator and the lights from the storage battery or vice versa.

The storage battery is charged and discharged through the ammeter and the voltmeter is connected through a push-button to the bus-bars.

All lamps should be Mazda or Tungsten 6-volt, except the port and starboard light and the binnacle light, which should be 2 volts and connected in a series so that the binnacle light will form a tell-tale to indicate when sidelights are burning.

All wiring should not be less than No. 12, rubber-covered, and where exposed to weather run in conduit with weather-proof outlets. Inside wiring should be run in conduit, moisture-

### Conveniently Arranged.

REFERRING to figure 1: B, storage batteries; G, d. c. generator; A, snap-switch with indicator; C, snap-switch, plain; D, timing device for spark; E, lights; P, primary winding of induction coil; S, secondary winding of induction coil; V, vibrator; Z, single-pole knife switch (similar to the Trumbull type).

The diagram in figure 1 is arranged for jump-spark engine, but it may be applied to the make-and-break type, by slight alterations in the wiring and results will be the same.

The switches should be grouped in an accessible location, so as to be under the control of the engineer. A good plan is to have the lighting circuit made as in figure 2. When the engine is not running and light is wanted one light may be turned on without throwing the whole circuit on the batteries. This will prolong their life, inasmuch as they will be working below their rated output. A storage battery of three cells should be used, which will give a voltage varying from 5.4 to 8, according to the conditions of the charge. The size of plates usually used are about 4½" x 4", five to the cell; giving the case for the three cells about 8" high, 6" wide and 13" long. This size cell gives 2½ amperes for 8 hours. The next sizes of batteries give 1¼ and 3¾ amperes for 8 hours. The 1¼ ampere battery is good for 3 one-candle power lights; 2½ ampere, 5 lights and 3¾ ampere, 7 or 8 lights. In charging batteries of this size the charge will be complete when an excessive amount of gas, or boil, is noticed.

The generator should be of the direct-current type, voltage about 10 and of current capacity suitable to the size of engine and lighting, allowing about .5 amperes per candlepower

at a voltage of 8. Special care should be exercised that switch "A" should not be left on when the generator is not running, as the batteries will be rapidly run down.

The combinations and advantages of this system are as follows:

1. Engine may be started on storage batteries and switched on generator.
2. The generator may be used for running engine, lighting circuit and storing batteries at the same time.
3. The batteries may be used for running engine.
4. The batteries may be used for lighting circuit or running both engine and lighting system.

H. L. FULLER, Phœbus, Va.

## The Floating Storage Battery System.

THE ideal electrical arrangement for the motor boat is naturally the simplest arrangement that will give the necessary results.

Where the combination of ignition and lights is to be used, the floating storage battery system is, no doubt, the simplest. The principle of the system is as follows: In starting the motor, ignition current is drawn from the storage battery. When the dynamo has attained its normal r.p.m., it is switched in to take up the ignition by means of a double throw switch, which at the same time cuts out the storage battery.

The drawing to which we must now refer is shown for a four-cylinder motor. The storage battery, it will be seen, is connected on the coil side, to the dynamo. The other side of the charging circuit is completed through an automatic charging switch which can be bought for this purpose. This switch closes the circuit, allowing current to pass into the battery when the voltage of the dynamo becomes an adjusted amount higher than that of the battery. This switch opens the circuit also when the voltage drops below that of the battery as, for instance, when the engine is stopped or even slowed down to a point where the battery would discharge back through the dynamo. Six volts is the standard pressure for ignition and lighting, and, as the line voltage will be higher when the battery is charging, a small rheostat is put in series with the lighting circuit by means of which six volts can be maintained across the lamps, insuring their proper length of life.

It is a good plan to protect the storage battery circuit at least, with fuses. A fuse in each lamp socket would be very desirable, as every short-circuit would not plunge the boat into darkness by blowing out the main fuse. Switches, of course, can be arranged to suit the owner, and are not indicated in the drawing.

On cabin boats where six volts are used for lighting, a tell-tale lamp inside the cabin in series with the running or anchor lights is impractical and an automatic cut-out as shown in drawing will be found of use.

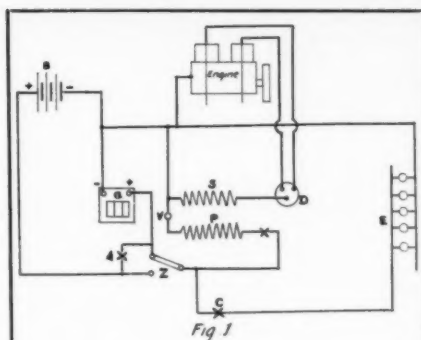


Fig 1

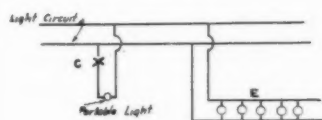
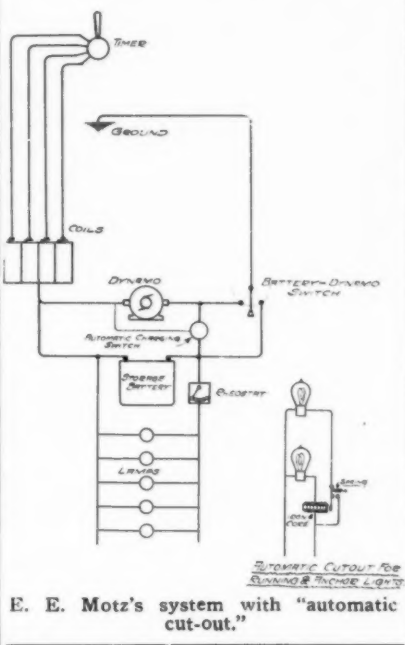


Fig 2

The diagram referred to by H. L. Fuller.



E. E. Motz's system with "automatic cut-out."

The working of the cut-out is as follows: Two lamps are put into each light. One wire of the first lamp is wound around an iron core, as shown in drawing, magnetizing it and drawing over the armature against the pull of a light spring. When this lamp burns out the armature is no longer held and springs open, closing the circuit of the second lamp, which continues the lighting.

This will make the constant watching of the lamps unnecessary.

E. ELMER MOTZ, Philadelphia, Pa.

## Many Possibilities.

FOR the arrangement of the electrical equipment and wiring system to be ideal it should be the most practical one from the standpoint of service, considering, of course, the first cost, maintenance, space occupied, accessibility, etc.

To be practicable it should accomplish its object, working at the greatest efficiency with a minimum of attention or trouble, but should the latter arise, the ease by which it may be located and quickly corrected is a large factor.

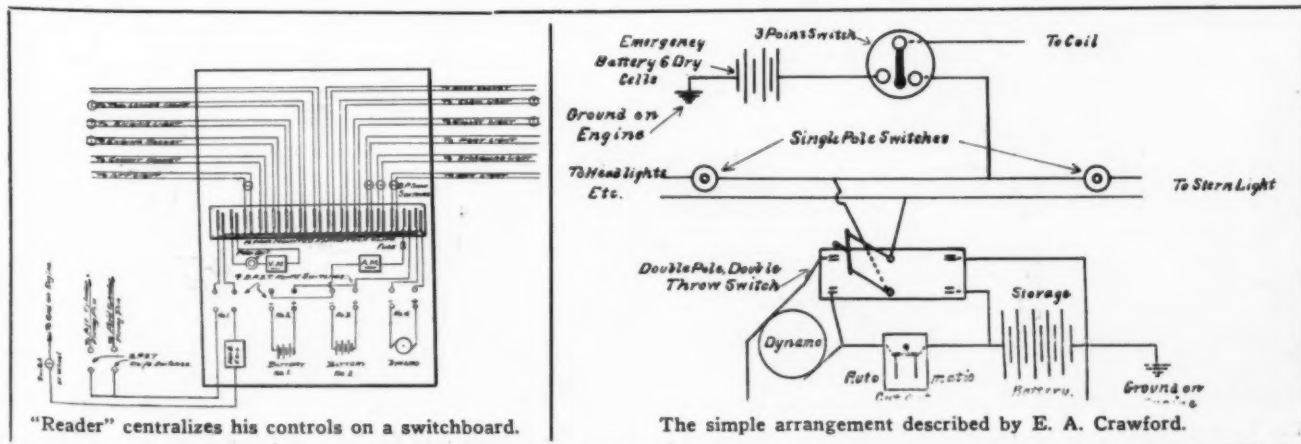
There is probably nothing connected with a boat's construction or operation in which the right and the wrong ways are so clearly defined as in the electrical department. The switchboard should be placed as near the motive power as possible, so that when the switches are "open" practically the entire wiring is "dead," otherwise there would be a considerable amount of the wiring that would be always "alive."

By all means have your switches on the board so arranged that by opening them the entire "outside plant" can be opened up. In case of trouble, such as a "short," "cross" or "ground," this will be of great benefit, as it may save your battery from being discharged before you can locate the fault. By opening the switches on leaving the boat you will know that there is nothing connected to the battery that might give trouble during your absence.

Use only double-pole switches—the single-pole ones open up only one-half the circuit leaving the other side "alive" and only reducing the chance for trouble by one-half. Knife switches having spring contacts are a fine thing, but those without such contacts are the most dangerous part of the electrical equipment. Use wire of a large diameter and have the mains protected by a fuse. Nothing but the best waterproof insulation should be allowed and where the wire is subject to excessive vibration or constant handling the conductors should be stranded. In the vicinity of the compass a twisted pair will prevent the current from affecting it.

Fahnestock clips mounted on a hard rubber or fiber strip make excellent terminals for the back of the switchboard. Running two wires along the strip, soldering them to alternate clips, as shown in the diagram, forms bus-bars to which permanent or temporary connections can be quickly made without the use of tools and in a case of trouble the affected part can be quickly disconnected.

Flexibility and duplication of the less reliable portions of plant are vital points. The wiring and switchboard plan shown illustrates such a system, and the following table shows the valuable combinations possible with the four main switches: Switch No. 2 closed, lighting system operating on battery No. 1; switch No. 3 closed, lighting system operating on battery No. 2; switches Nos. 2 and 3 closed, lighting system operating on batteries Nos. 1 and 2 connected in parallel; switches Nos. 1 and 2 closed, lighting and ignition systems operating on battery No. 1; switches Nos. 1 and



"Reader" centralizes his controls on a switchboard.

The simple arrangement described by E. A. Crawford.



3 closed, systems operating on battery No. 2; switches Nos. 1 and 4 closed, systems operating on dynamo; switches Nos. 1, 2 and 3 closed, systems operating on batteries Nos. 1 and 2 connected in parallel; switches Nos. 1, 2 and 4 closed, system operating on battery No. 1 and dynamo, battery No. 1 being charged by dynamo; switches Nos. 1, 3 and 4 closed, system operating on battery No. 2 and dynamo, dynamo charging battery No. 2; switches Nos. 2, 3 and 4 closed, system operating on battery Nos. 1 and 2 dynamo, dynamo charging batteries 1 and 2 connected in parallel.

The two single-pole switches in the ignition circuit are very handy when running with the clutch out, as either cylinder can be cut out causing the engine to run much smoother. They are also useful to detect which cylinder may be missing.

"Reader," Norwich, Conn.

### A Simple System Without a Switchboard.

THE accompanying sketch shows the wiring of an ignition and lighting plant suitable for large or small launches. Of course, it will be necessary to enlarge the capacity as occasion demands. Before attempting to purchase the necessary equipment it is advisable to figure up the number of lights required and add the consumption of ignition circuit to determine the size of dynamo and storage battery to supply same. The storage battery should have a capacity in ampere hours sufficient to maintain a working charge for at least ten hours, as most manufacturers claim it is detrimental to the elements to exhaust a storage cell in less than that time.

The diagram does not show a switchboard, as in use on small launches it is unnecessary; besides it would be a problem to find a proper place to put it. The four switches shown may be mounted on a small board which has been given a coat of asphaltum paint and fastened in a handy locker out of the way as it will only be necessary to reach in now and then and throw the switches.

The dynamo is one of the standard type driven by friction from the fly wheel, and is fitted with an automatic governor to regulate the output. The storage cell is wired to the dynamo with an automatic cut-out put in series to prevent discharge of battery back through dynamo and care must be exercised to connect same up correctly; that is, the wire from the positive pole of the dynamo must run to the positive terminal of the battery so that the battery will not be charged in the wrong way. This is easily determined as the terminals are marked plainly—positive, negative.

A double pole double throw switch controls the whole outfit. The line or wires leading to the different lights and to the coil switch are fastened to the middle terminals while the load wires from the dynamo are led to the terminals on the left-hand side. The storage battery leads are on the right side, so that by throwing the switch to the left you feed directly from the dynamo and to the right from the storage battery. All the time the dynamo is running the surplus current is accumulated in the storage cell where it is available for lighting purposes when it is required.

The lighting circuits are controlled by two single pole snap switches, and in wiring up, use a two-wire lighting cable in preference to the ordinary wire, for while it is a trifle more expensive it is all but indestructible. On a

large boat it is better to run this in pipe, and use the standard waterproof terminals for outlets, but on small open launches the cable may safely be run along the under side of the coaming and terminate in attachment plugs. The running lights may be altered for electric lighting by merely cutting a small hole in the corner of the doors large enough to admit a piece of flexible lamp cord and the electric sockets secured to the oil burners with a clip. This will allow their removal in an instant should trouble happen to the electric system. The lamp cord should be long enough to reach from the lamps to the attachment plugs in the circuit and when not in use it may be stowed away with the lamps.

An emergency battery of six dry cells is shown which, if placed in an airtight case, should last all season and may be used to start the engine if the storage battery is exhausted. A magneto may be added to the outfit by changing the three-point switch to a four-point and wiring up the same as the emergency battery.

To start the engine throw the three-point switch and also the double throw switch to the right, and as soon as she is running smoothly throw the double throw switch to the left so as to feed directly from the dynamo.

This system is probably the least expensive it is possible to secure and at the same time be serviceable, and with ordinary care will last many seasons. Tungsten lamps are preferable to the carbon ones, but it will be necessary to keep a supply on hand as they are very frail.

The diagram illustrating this system is very clearly shown at the bottom of the preceding page.

E. A. CRAWFORD, Newark, N. J.

## The Original V-Bottom.

The Modest Chesapeake Bay Skipjack, the Forerunner of the Now Popular "Deadrise" Type of Motor Boats—Her Origin and Latest Development.

By Stuart Stevens Scott.

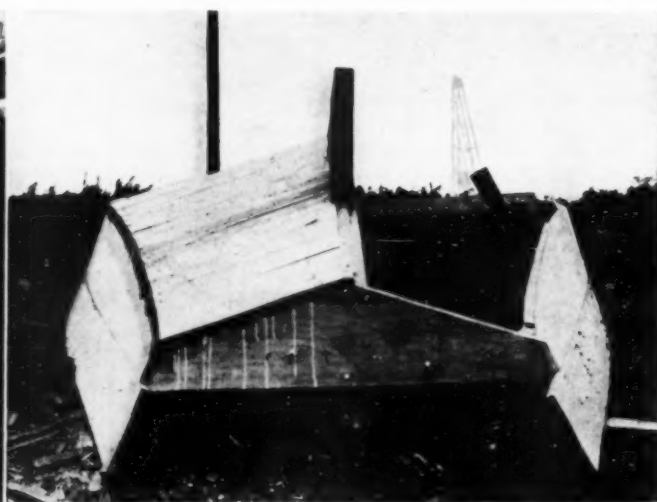
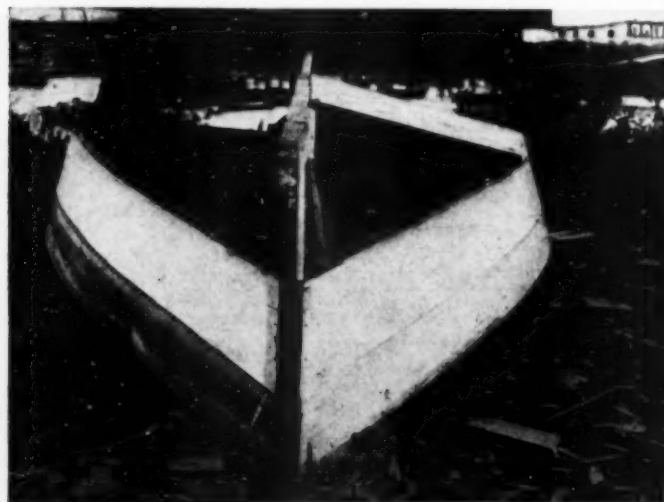
DURING the past two or three years motor boatmen have heard and read a great deal of the V-type of hull which some designers have adopted for speed boats with more or less success, but, for all that, there are probably but few who know that the original V-shaped boat is the Chesapeake Bay skipjack which has been in service for many, many years and which has proven its worth in competition with the batteau, pereaue, bugeye and pungy, to say nothing of the sloop and schooner, types of all being found on the bay.

By many the V-type is referred to as the "deadrise" and as such it is generally known on that great inland sea that divides the state of Maryland and washes the shores of Virginia. The origin of the type dates back so far that no one that I have ever met can tell of it. For 100 years, at least, they have been built and one story is that the man who built the first one started to build a batteau, or flat-bottomed boat. By mistake he sawed his floor boards too short and decided that he had better put in a keel. In putting in the keel he got

it too low by several inches. Notwithstanding this mistake he went ahead and when the boat was completed he had a shape that was different from what he had intended it to be.

Greatly to his surprise, and to the surprise of his neighbors, the boat proved to be a better sailer than the batteaux of the same size. This established a precedent and from that time on the new type was adopted, being improved by giving the keel a greater drop and making the V sharper.

There are several hundred of these skipjacks



The bottom planking of the original skipjack is laid transversely. Many like the one here illustrated are now being built for power.



The law, which was originally a protection for the small oystermen in the days of the steam dredge, prohibits the use of power-driven vessels, but it is cleverly evaded, for there is now scarcely a skipjack without her motor tender. Note the characteristic skipjack stern with rudder on transom.

in everyday use on the Chesapeake and some of them are big fellows, too, being 50 feet to 60 feet over all, and they are used in all of the branches of maritime trade—fishing, oystering and general freighting. The majority of them are now auxiliaries under which rig they are about as handy a type of boat as can be found, their leg-o'-mutton mainsail being easily handled. Indeed there are few of even the larger craft that carry more than two men while the smaller ones carry a man and a boy.

Owing to the deadrise hull being cheaper and easier of construction there are many of them that are out-and-out power boats, and while they are not particularly speedy they are steady and sturdy. Of shallow draft they are thus able to run through the numerous narrows and up the shallow creeks to get and to deliver their cargoes.

In the building of a skipjack the first requisite is heavy timbers for the keel and the frame and stout boards for the floor, inasmuch as there are no ribs, as in the round-bottomed type. Of course, the shape must be determined and this will be in accordance to what use the boat will be put. For sailing, or auxiliary, it is usual to have the greatest beam aft of the 'midship section, but for a power boat the lines are more refined and the greatest breadth is forward of the 'midship section.

The stem and stern posts are rabbeted to receive the side planks while the keel is rabbeted to receive the bottom planks which are carried out and made fast to the frame and the lowest side plank. In putting on the bottom planks they are set at an angle of about 25 or 30 degrees rather than at right angles with the keel, this method being considered stronger.

As a rule, the skipjack is a product of a "down-the-bay" yard, located at some creek, and the shipwright, when not following that calling, is a farmer. His kit of tools is meagre but his skill with them makes up for it and, although his handiwork may be rough, it is nevertheless strong and gives the owner satisfactory wear.

On the other hand, a capable boat builder, following the "deadrise" model, can produce a boat that for speed, comfort and general

worth will equal if not surpass the conventional round-bottom model of equal length. There are hundreds of the "deadrise" type of motor boats and there are few owners who are not satisfied with the way they will go into a heavy head sea without pounding.

Still, outside of the waters of the Chesapeake, there are not so many who are aware that the V-type is nothing more or less than our old friend the skipjack that has been doing business for, lo, these many years.

There are, however, even on the Chesapeake Bay, many modifications of the skipjack—so many that one sometimes wonders just where the original lets go and the modification begins.

In the true skipjack the lines are somehow remindful of a pumpkin seed, sharp at the bow and with the greatest beam near the stern, or on the quarter. The G. W. Calvert, a power skipjack, with sail as an auxiliary, is of this type, although she is a modification, the rudder being hung deep. In the true skipjack, and particularly as applied to the sailing craft, the rudder is hung on the transom.

When building for the installation of power, and the majority of those of recent build are, there has been a tendency to build out the deck because of the additional room afforded.

An excellent example of the skipjack, or deadrise, as applied to sailing yachts, is the Ventura, of the Corinthian Yacht Club, of Baltimore. Although a keel boat, having a fin that gives her a draft of nearly 5 feet, she is, in many respects but a refinement of the merchant skipjack. She is 26 feet over all and, for her size, is wonderfully able, capable of withstanding much more ill treatment by the seas than her crew can endure. In other words, there comes a time when it is beyond human endurance to remain on the bay in wind and seas in which the little yacht makes good weather, considering.

On the other hand a skipjack model, refined, with power in it, makes an ideal craft for cruising, even in fairly open waters. An example of this type is the Boss, of the Maryland Motor Boat Club, of Baltimore, a 30-footer, that has been all over the Chesapeake, and in weather that has forced boats of greater size to seek harbor. The Boss is but moderately

powered, having but 12 horsepower, and yet she has been able to come home at all times.

It is in the merchant service that the powered skipjack is increasing in numbers annually. There would be a far greater increase were it not for the Maryland oyster law, which prescribes that boats employed in dredging shall not use any power other than sail when working on the oyster beds.

This law was probably passed to aid the poor oystermen who could not own and operate steamers, the law having been passed before the marine gasoline engine was heard of, but it is likely that the legislature, in some near future, will modify the law to the extent of permitting the use of power craft. Already the authorities have permitted the employment of gasoline engines to operate dredge winders.

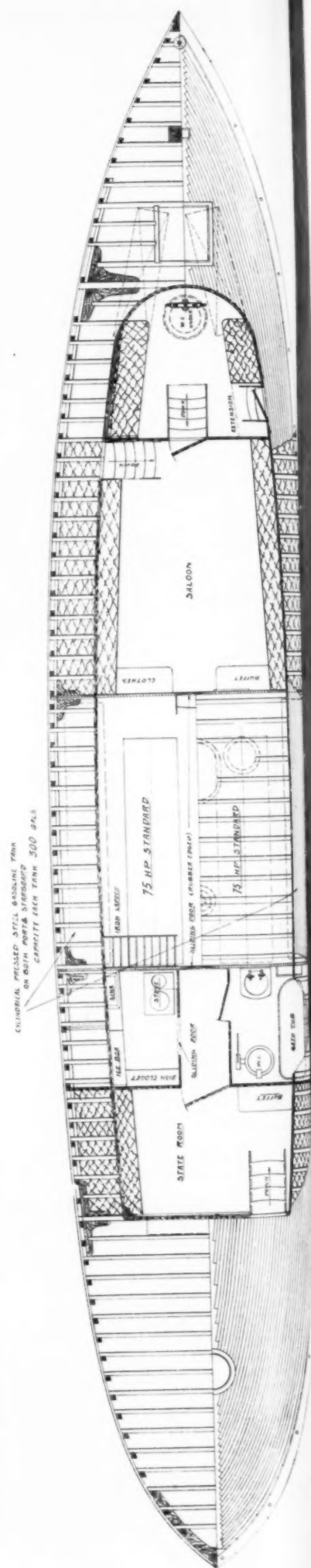
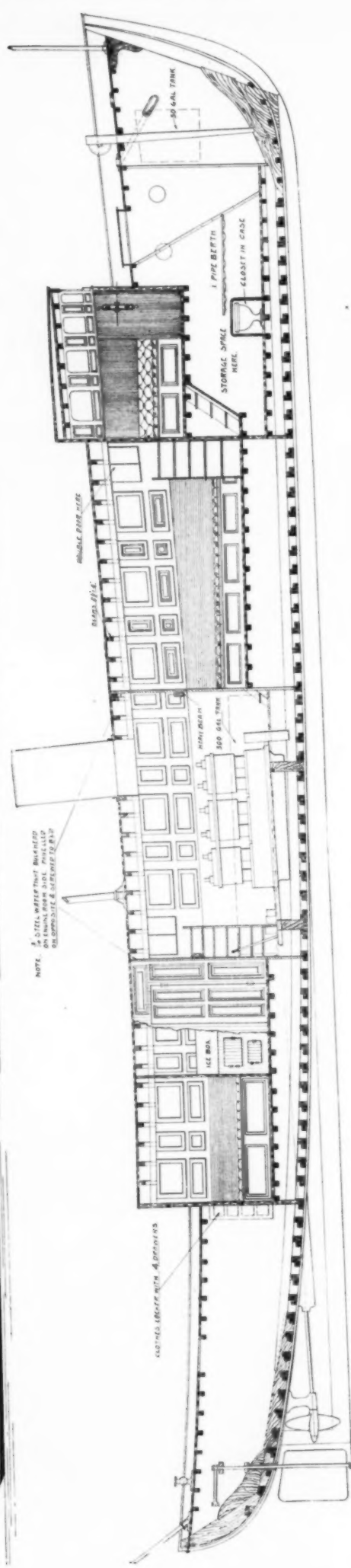
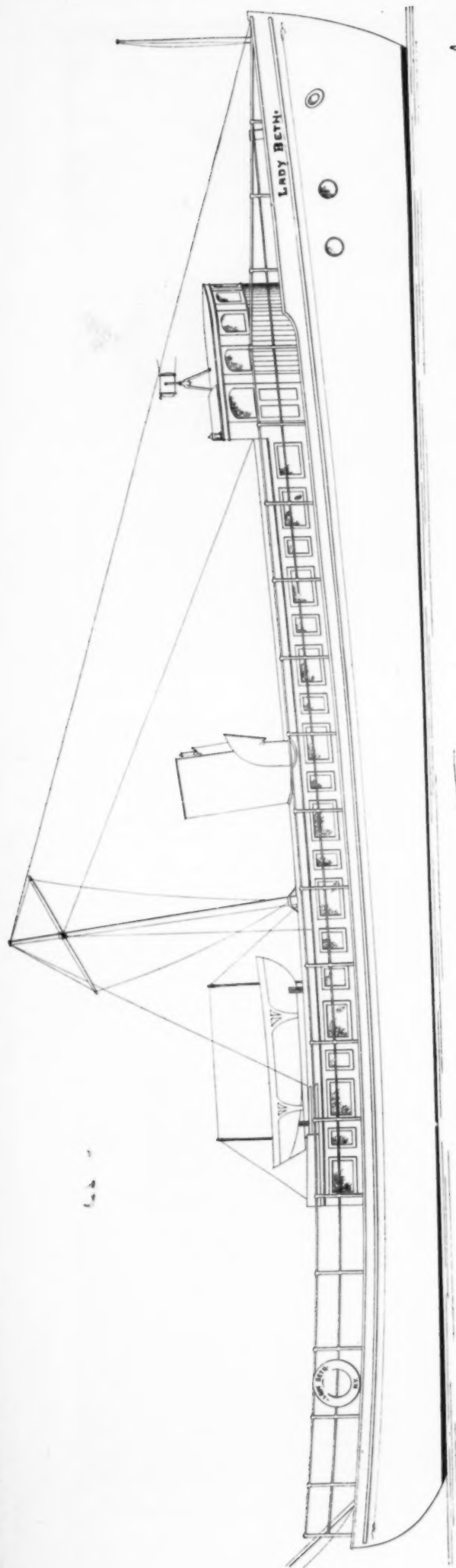
But it's a mighty strange law that cannot be evaded and that is just what is happening now on the Chesapeake. While no dredger would think of operating a power boat, or even an auxiliary, he does not for a moment hesitate to use a power yawl to tow when the wind is light; that is, he tows from the oyster beds to harbor and *vice versa*.

Already there has been a storm of protest against the use of power yawls, charging that the law is being violated, but those who have the power feel that they are not, though they may be, "skating on thin ice," while those who have no power yawls are hastening to get them that they may be equal to the competition of their fellow dredgers.

Perhaps one of the most interesting of Chesapeake Bay skipjacks is the San Jorge, now in service on the river of that name in the Republic of Colombia. She is 38 feet long and equipped with a 14 horsepower two-cylinder Rapid engine. She is said to be the first power boat in use in Colombia waters. Although a modification, in regards to her deck lines, it will be seen by the picture that she is a true skipjack under the water.

Another specimen of the merchant skipjack is the Effie, a 60-footer, built for running general merchandise between Baltimore and tidewater ports on the Chesapeake. She is equipped with a 25 horsepower Globe engine and carries sail for assistance in fair winds.





# NEW MOTOR BOAT DESIGNS

## A Deep Water Cruiser.

UPON the preceding page is shown the design of an 80 x 16 foot cruising yacht, designed especially for deep-water use by W. F. Ruddock, 213th Street and Harlem River, New York City, for a prominent New York yachtsman.

No expense has been spared in this vessel, to turn out a craft which will be particularly seaworthy, and which may be depended upon to go to sea several days at a stretch, and to stand any heavy weather that may be encountered.

The keel frames and deadwoods are all especially heavy, and are bolted together with copper fastenings. All the planking is of long-leaf yellow pine,  $1\frac{3}{4}$  inches thick and copper fastened throughout. The garboard and sheer-strake are of white oak and the decks are of white pine timbers,  $1\frac{1}{2}$  inches square, running with the sides of the vessel and blind nailed. A bulwark, as shown in the plans, is provided, which makes a guard when at sea, and in addition to this there is a hand-rail on the top of the cabin.

Throughout the vessel there are plenty of hanging knees, all copper fastened, and everything in the way of clamps, stringers and scantlings are unusually heavy and well fastened. There is a deckhouse forward constructed of African mahogany and provided with heavy plate-glass windows which are built to drop down into the casings. These are fitted water-tight, and are so finished that the water will drain off in a storm.

With the exception of the engine room the interior of the vessel is of solid mahogany, handsomely finished. The engine room is in yellow pine with a rubbed finish.

Below decks the extreme forward portion of the vessel will be occupied by a 50-gallon gasoline tank, and after this, separated by a collision bulkhead, are the crew's quarters. On either side of these quarters is a hanging berth and farther aft, under the pilot house, is stowage space finished in cypress.

Aft of the pilot house, communicating with it by a short flight of steps, is located the saloon, highly finished in mahogany and paneled. The saloon is fitted with clothes lockers and a buffet, and has comfortable seats along each side.

Aft of the saloon is the engine room fitted with work-benches, tool-racks, etc., and equipped with transom seats covered with leather cushions. The power equipment includes two 75 h.p. Standard motors and upon either side of the motors is located a 300-gallon gasoline tank built of pressed steel. An iron ladder from this compartment leads to the deck.

Aft of the motor room upon the port side is the galley, equipped with an icebox and all the necessary conveniences. Across the passage from this is the bathroom, finished in mahogany and rubber tiling. Directly aft of these rooms is a stateroom finished in mahogany, and having a transom berth upon either

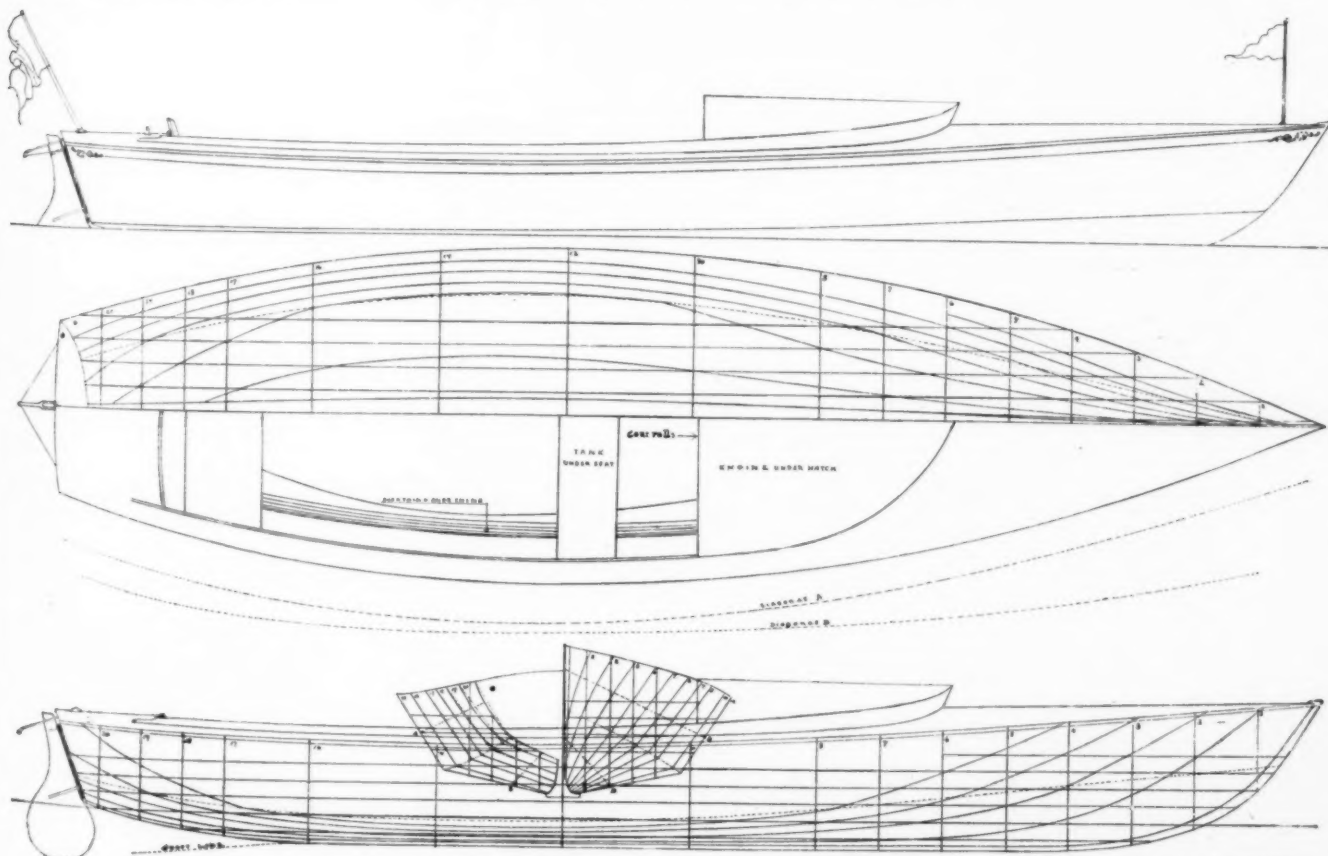
side. This stateroom has a parquet flooring, and all the partitions, etc., are of paneled mahogany, showing an especially fine grain.

The engine room is really separated from the rest of the vessel, as it is provided both forward and aft with watertight steel bulkheads thoroughly protecting it.

A stack is fitted almost amidships directly over the motor room, and into this both the motors exhaust. A ventilator of polished bronze is located near the stack and ventilates the engine room. A military mast is carried aft of the stack, and at the after end of the cabin above is carried a dinghy on davits. The vessel is designed to make 15 miles an hour.

This vessel represents a very efficient type which has been developed after the lines of the small steam yacht, although a much greater amount of space is secured through use of the internal combustion motor. The after deck is of good size and, although by far the greater portion of the vessel is occupied by cabin room, plenty of space is provided for deck space aft, and even the roof of the trunk cabin may be used when occasion demands.

She will not carry a large party except on short day trips, but for small parties the vessel is almost ideally arranged. The saloon and pilot house are well forward, and the one stateroom being aft of the engine room and separated from it entirely by a sliding door, can be cut off entirely from the remainder of the vessel. This gives access to the large after deck.



A design by J. L. Foster of a V-bottom runabout 27 feet over all. This type has proven very popular for use in rough waters.



## A 30-Foot Fast Cruiser.

THE plans shown below are those of a 30-foot cruiser of rather light construction, designed by Ernest Rolland, 55 St. Francis Xavier Street, Montreal, Canada, and equipped with a motor of medium weight.

In order to procure as much speed as possible, the framing and construction throughout are light, but sufficient regard has been given to seaworthiness to make the craft a capable one in every respect. The framing is of  $\frac{3}{4}$  by 1 inch planks, and the planking itself is of  $\frac{3}{4}$  inch material. The frames are spaced 7 inches from center to center.

A profile of the craft shows rather straight lines, with a perpendicular stem, and an out-board rudder. She is of the raised deck type, and has a cockpit of large proportions, occupying almost half of her length.

The cabin is sufficiently large to allow comfortable quarters upon extended cruises, and contains all the necessities for such a trip, insuring ample living quarters for two persons, or even more if necessary.

The stateroom proper occupies the forward portion of the flush-deck section, which is aft of a locker in the bow of the vessel. The stateroom is equipped with 2 transom berths, and plenty of shelf space. It opens through double-swing doors into a section devoted to the galley, which is equipped upon the port

side with a sink and amidships with a stove. A good-sized locker opens from this section at the starboard side of the boat, and a short flight of steps leads up to the cockpit upon this side.

Under the section of the cockpit to which the steps lead is placed an icebox, which is accessible from above. The engine is located under the hatch in the cockpit, and is so arranged that it is perfectly protected under all conditions, and yet is easily accessible, so that it may be reached at any time in an emergency or for ordinary repairs.

The forward cabin is ventilated by a skylight in the deck and by a cowl placed forward of this. In addition there are three port lights upon either side, giving plenty of light and air to the interior. The steps leading down into this cabin may be covered by a hatch in stormy weather, so that the craft is well protected.

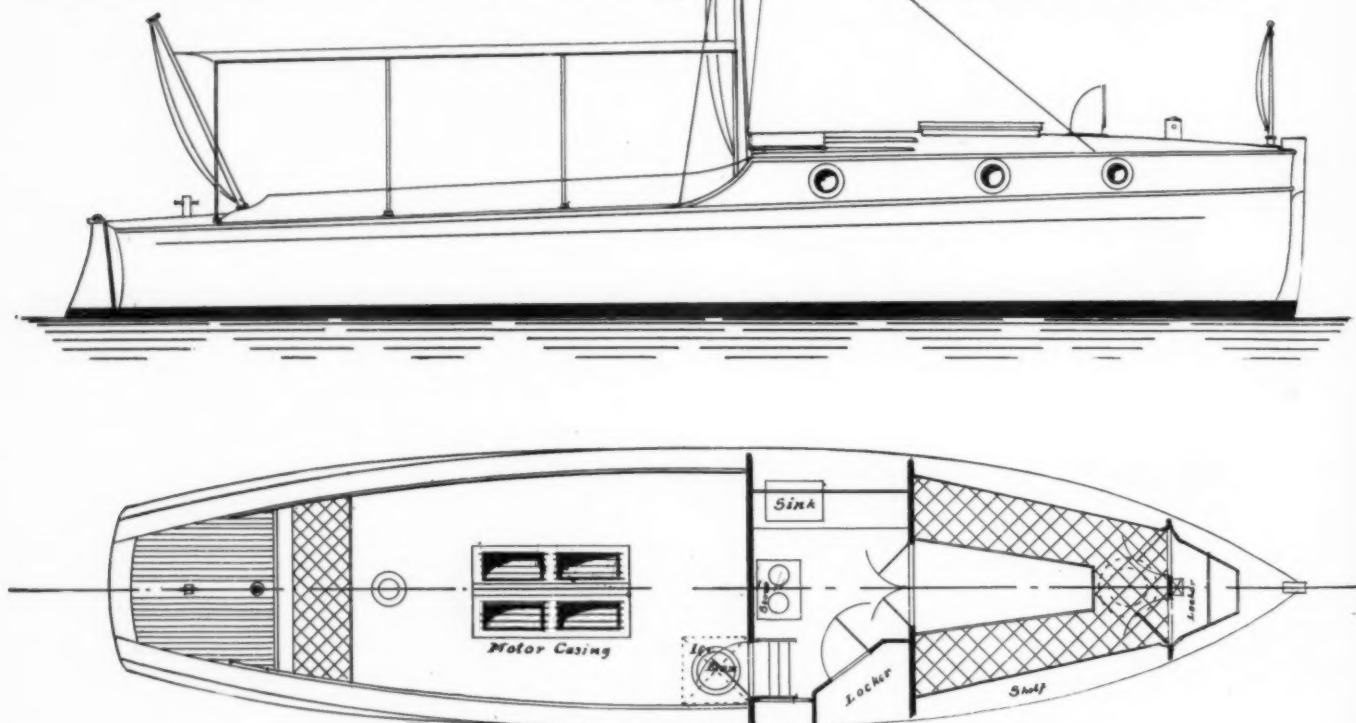
The cockpit is covered by a removable awning upon stanchions, and the steering is accomplished from the port side by a wheel secured to the after end of the cabin. A good view may be obtained from this position, and all running

difficulties are overcome since the motor may be reached easily in case of need. The motor develops about 25 horsepower, and drives the boat at 14 miles per hour.

The lines of the vessel are rather straight and resemble to a large extent the popular type of small cruiser built in England. There is a slight rake towards the stern, but the general appearance of the craft forward of the signal mast carries out the straight line idea with but slight sheer.

The cockpit is so arranged that, if necessary, additional seats may be installed upon both sides of the motor, and with detachable curtains used in connection with the awning stanchions, the vessel may be made very comfortable to sleep at least two more persons in ordinarily moderate weather. There is sufficient room upon either side of the motor for the installation of these seats.

The speed obtained with this power equipment is somewhat surprising, as the lines of the craft would not ordinarily indicate any more than possibly a low average cruising speed. This is accomplished, however, by cutting away the dead wood as much as possible below the water line, and carrying the entire construction aft far enough to provide a rather wide transom at the stern which will not draw down when under way.



The 30-foot cruiser described above. She is well-arranged for long trips.

## A 27-Foot V-Bottom Runabout.

THE designs shown at the bottom of the preceding page are similar to an 18-foot craft built by the same party a few months ago, and they have proved very successful for a vessel of this type.

The designer is J. L. Foster, of Orcas, Washington, and the lines show a development of this type of small runabout for the past 40 years. The designer has proved to his own satisfaction that this craft will show more speed for the power installed than any other model, and at the same time is exceedingly seaworthy.

Owing to the large amount of reserve buoyancy, this boat is particularly good in keeping up speed in a seaway, as she slides down into it gently so that a wave instead of coming

aboard, is thrown downward, and is rolled along under the side by the lines of the hull.

She is built so as to perform satisfactorily with small power, although the construction is such that if a large power is installed, the form will plane outward, so that with her full after section she will run on a smaller displacement without squatting. She serves therefore primarily the same purposes as the step boats but possesses none of their disadvantages.

This little craft is symmetrical from every point of view, and is entirely free from any freak characteristics common to some boats of this type. Her lines make her quick to answer the helm, and she will keep a straight course without effort on the part of the helms-

man, her long, straight keel holding her on a true course. The lines also cause her to enter the water with scarcely a splash, and she leaves almost no wake when running at top speed.

A boat built on these lines is very easily constructed since there is no steaming of frames and her designer states that anyone possessing a fair amount of mechanical ability can duplicate the boat from the working drawings. The length over all is 27 feet, the length on the waterline is 23 feet 9 inches, the extreme beam is 7 feet 1 inch, and the beam at the waterline is 5 feet 4 inches. The freeboard at the bow is 2 feet 8 inches, at the stern 2 feet  $1\frac{1}{2}$  inches, and the least freeboard is 1 foot 7 inches.

# A New 40-Foot Cruiser.

ONE of the most interesting cruisers of moderate size which will go into commission early this year is the one whose designs are shown below which is being built at the shops of Wm. Haff, of New Rochelle, N. Y., for Mr. H. J. Cushing, Jr., of the Columbia Yacht Club, New York City. The craft is from the boards of Wm. J. Deed, Jr., of Boston, and is particularly interesting because she is equipped with a new type of motor. It is expected that her performances will be watched with considerable interest by motor boatmen in the vicinity of New York City, as while she is of a very commodious design her lines and power will permit sufficient speed to make her fitted for long cruising races.

The dimensions of this vessel are 38 feet 11½ inches over all, with a beam of 9 feet 2 inches, and a draft of 3 feet 6 inches. She is a combination of the raised and flush deck with the trunk cabin type, having a small after cabin and a cockpit between the two cabins.

The plans call for a very staunch construction and the sections of the vessel that have been thus far completed indicate that this idea will be well carried out through her entire length. The keel, stems and stern are of native oak, 5 inches wide, and the construction is further strengthened by running the keel in one piece the entire length of the boat.

The frames are 1¾ by 1¾ inches and the planking is clear white cedar 1¾ inches from garboard to bilge and 1½ inches from bilge to deck. All of her lines are clean-cut and a sufficient sheer is provided to make her a dry boat, even in heavy weather. The canoe type of stern construction is used to give less surface resistance in passing through the water and to leave as small a wake as possible when traveling at top speed.

The main cabin arrangements provide ample accommodations for four people, and the after

cabin will accommodate one extra man who will make up the crew when the owner does not desire to operate the boat himself. The vessel is designed, however, primarily as a one-man boat, and the steering wheel, reverse gear and engine controls are all operated from the forward part of the cockpit upon the port side.

The extreme fore part of the vessel is occupied by a fresh-water tank which will carry a supply sufficient for long cruises. Aft of this, extending the full width of the vessel at this section, and entered from a central passageway, is a toilet-room with a large chest of drawers built in upon the port side. Upon either side of the passageway leading to this compartment is a large closet.

The main cabin or saloon occupies the central section of the trunk cabin portion and is handsomely and comfortably furnished with two transom berths with drawers under, the back cushions hinging up to form an upper berth. At the forward end of this cabin upon both sides are lockers, and a table with a pin-rail occupies the center of the compartment so that the saloon may be used as a dining-room.

The motor is placed a trifle aft of amidships in a compartment by itself which is entered from the cockpit by a companionway at the starboard side. The engine room is equipped upon the port side to be used as a galley and also provides ample space to store dishes, cooking utensils, etc. Upon the starboard side next to the companionway is a refrigerator extending to the height of the trunk sill, and aft of this is a clothes closet extending to the roof.

The cockpit is provided with one seat upon either side measuring 60 x 16 inches, and under each seat is a 50-gallon gasoline tank. At the forward end of the cockpit is another seat covering the reverse gear of the motor. The top of this seat lifts, rendering the whole motor easily accessible.

The after cabin is arranged for stowage and is provided with plenty of shelf space. A berth is also installed in this compartment.

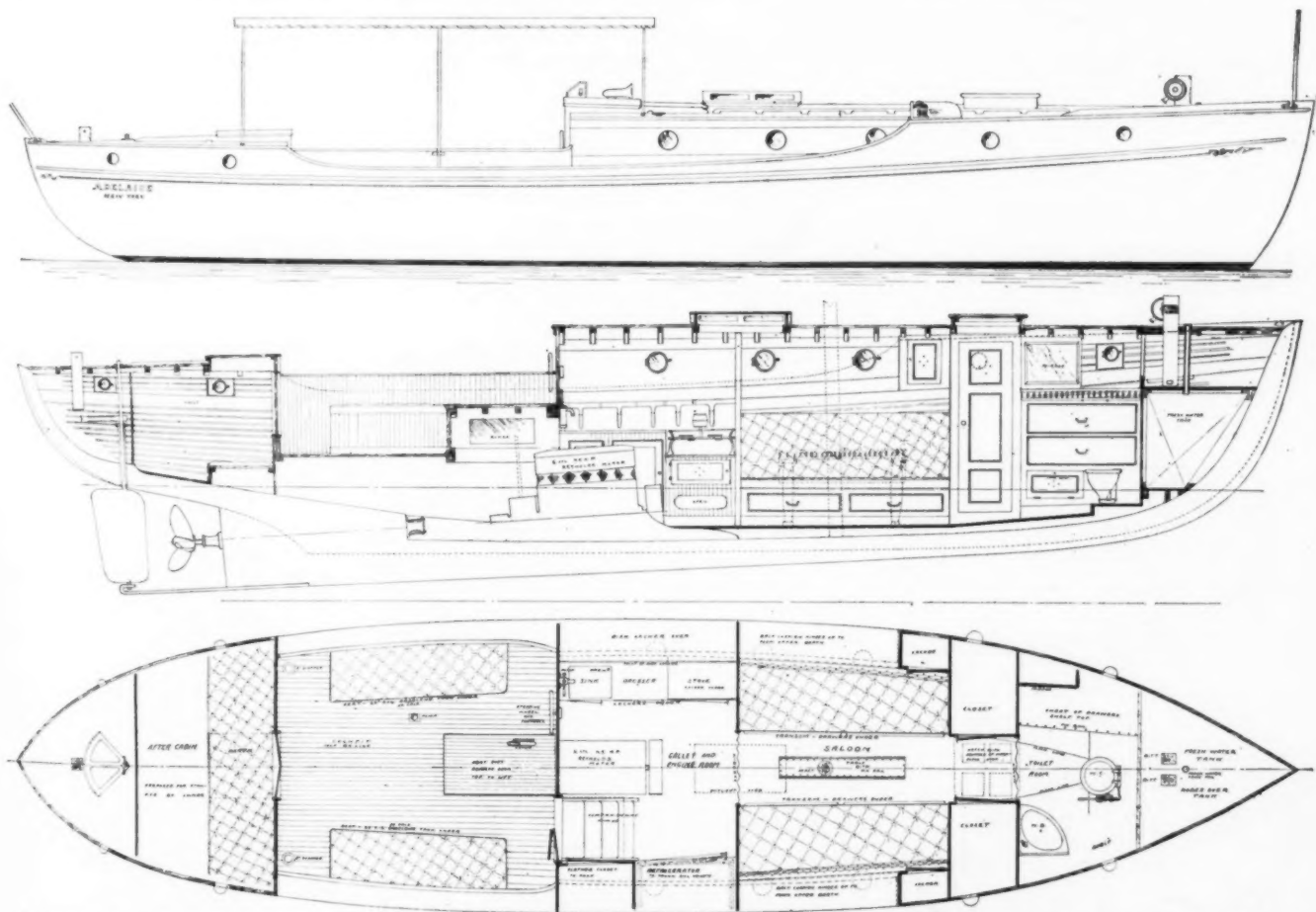
The motor equipment consists of one of the new 6-cylinder motors of 45 h.p., which has just been brought out by the Reynolds Motor Company, of Detroit. This motor is of the rotary valve type, and is expected to turn a 24 by 30-inch Hyde propeller, driving the boat at a speed of 11 to 12 miles per hour.

The entire finish of this vessel is very pleasing, and the decks are extremely serviceable, being laid with pine, canvas covered. The inside finish throughout is in white enamel with oak trim.

This craft is designed especially for cruising on Long Island Sound, and for outside cruising as well, being particularly adapted to rough waters. Arrangements are made for a mast to be stepped through a section of the main cabin, to use auxiliary sail power when necessary. The contract calls for the delivery of the boat upon April 1st.

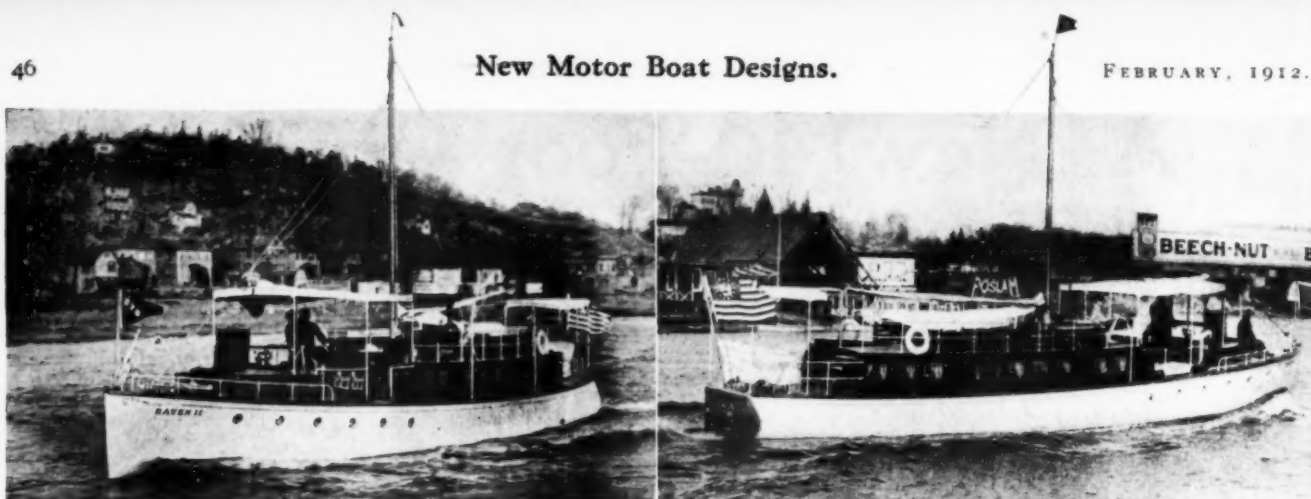
The ingenious arrangement of this motor is a feature of the boat, since the space which it occupies is not in any way wasted, and the motor, while out of the way, is very accessible. The main portion of the motor extends out into the engine compartment and may be easily approached from below decks, while the reverse gear and the after end of the motor is covered by a box extending above the cockpit floor. The cover of this box is designed to be removed so that the reverse gear may be attended to when necessary, and at the same time the box provides a seat in a very advantageous position.

The sides of this box are designed to be paneled in glass, but this is left to the discretion of the owner, and it is likely that the paneling will be in accordance with the remained of the vessel.



Adelaide, described above, is particularly adapted for Sound cruising. A new type of 6-cylinder rotary valve motor drives her at 12 m.p.h.





Raven II and Louisa, two sister vessels just completed for service in Florida during the winter.

## Two 55-Foot Sister Ships.

THE illustrations above, and the plans below, show the lines of two sister ships which have just been completed by the Gas Engine & Power Company and Chas. L. Seabury & Company, Inc., of Morris Heights, N. Y. City. Mr. Carl G. Fisher, of Indianapolis, is the owner of Raven II, and Mr. Stoughton A. Fletcher, also of Indianapolis, is the owner of Louisa. The two vessels left the shipyard the latter part of November together for a cruise south, where they will be used for service in Florida waters during the winter.

These yachts are 55 feet over all, 54 feet 6 inches on the waterline, and have a beam of 10 feet 6 inches and a draft of 3 feet. The keel and frame are of oak, with planking of cedar, copper-fastened, and all joiner work is of hardwood.

The crew's quarters are forward, and aft of these are the engine room and galley, followed by a cabin with extension berths, and completely equipped for comfortable living quarters.

Aft of the cabin is a bath on the starboard side, and a toilet-room upon the port side opposite. The owner's stateroom is in the after part of the vessel, and is very comfortably arranged and easily accessible.

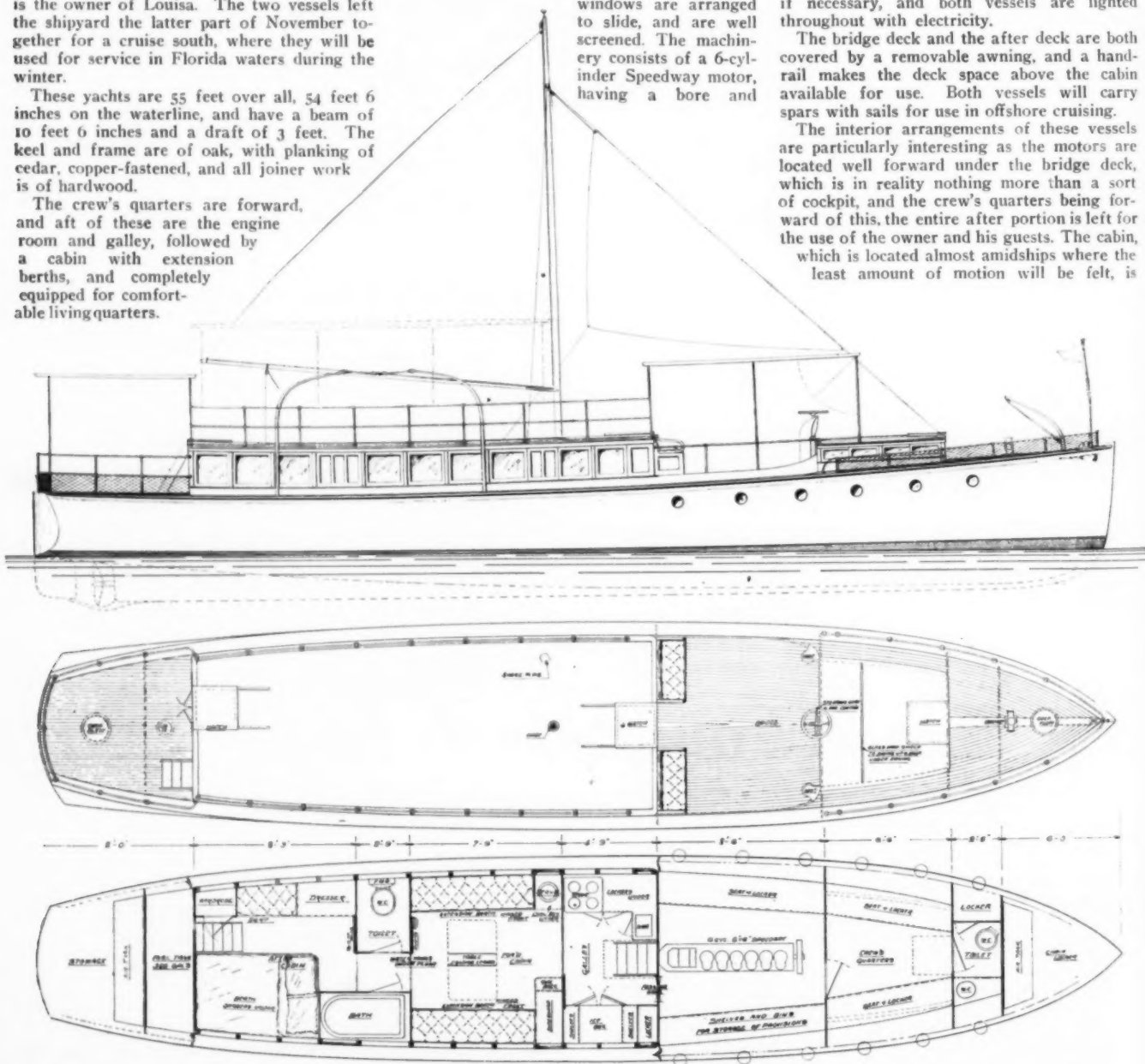
Above decks there is ample accommodation, particularly for wicker chairs on the stern deck. All of the cabin windows are arranged to slide, and are well screened. The machinery consists of a 6-cylinder Speedway motor, having a bore and

stroke of 6 inches, and developing from 50 to 60 h.p., which will give each vessel a speed of approximately 12 miles per hour. The fuel tanks, which are located at the stern aft of the owner's stateroom, have a capacity of 300 gallons.

The motors are controlled from the bridge so that each craft can be handled by one man, if necessary, and both vessels are lighted throughout with electricity.

The bridge deck and the after deck are both covered by a removable awning, and a hand-rail makes the deck space above the cabin available for use. Both vessels will carry spars with sails for use in offshore cruising.

The interior arrangements of these vessels are particularly interesting as the motors are located well forward under the bridge deck, which is in reality nothing more than a sort of cockpit, and the crew's quarters being forward of this, the entire after portion is left for the use of the owner and his guests. The cabin, which is located almost amidships where the least amount of motion will be felt, is



These sister ships described above are designed particularly for offshore cruising. Notice the deck space above the cabins.

provided with a folding table and a stove for heating the compartment, in addition to the comfortable upholstered seats which may be used as berths.

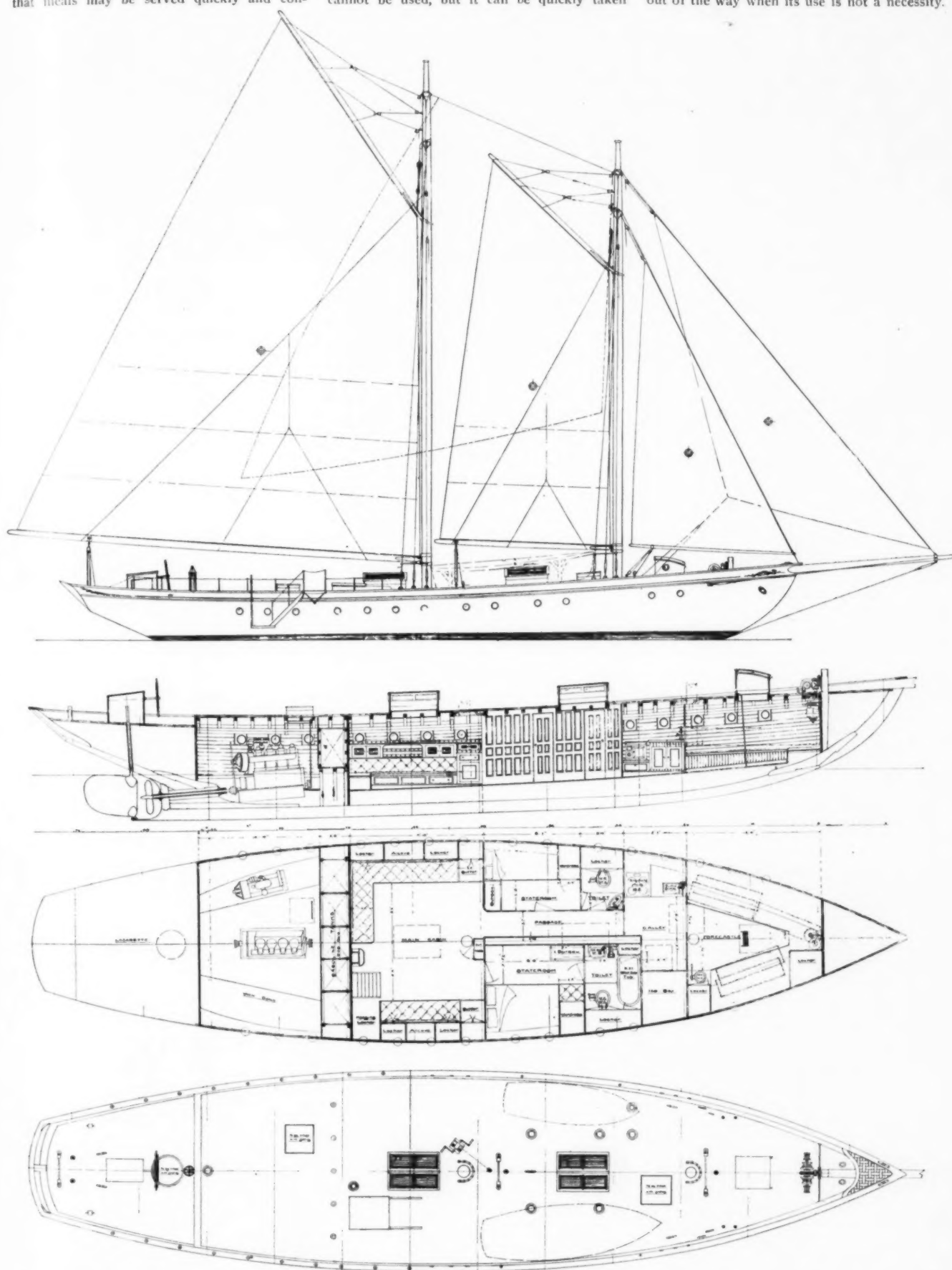
There is a sideboard in this cabin also and it connects immediately with the galley so that meals may be served quickly and con-

veniently. Fresh water tanks are placed under the floor so that they are well out of the way.

Each vessel is designed to carry a removable awning above the cabin, so that this deck may be covered without detracting from the appearance. Of course, when under sail this cannot be used, but it can be quickly taken

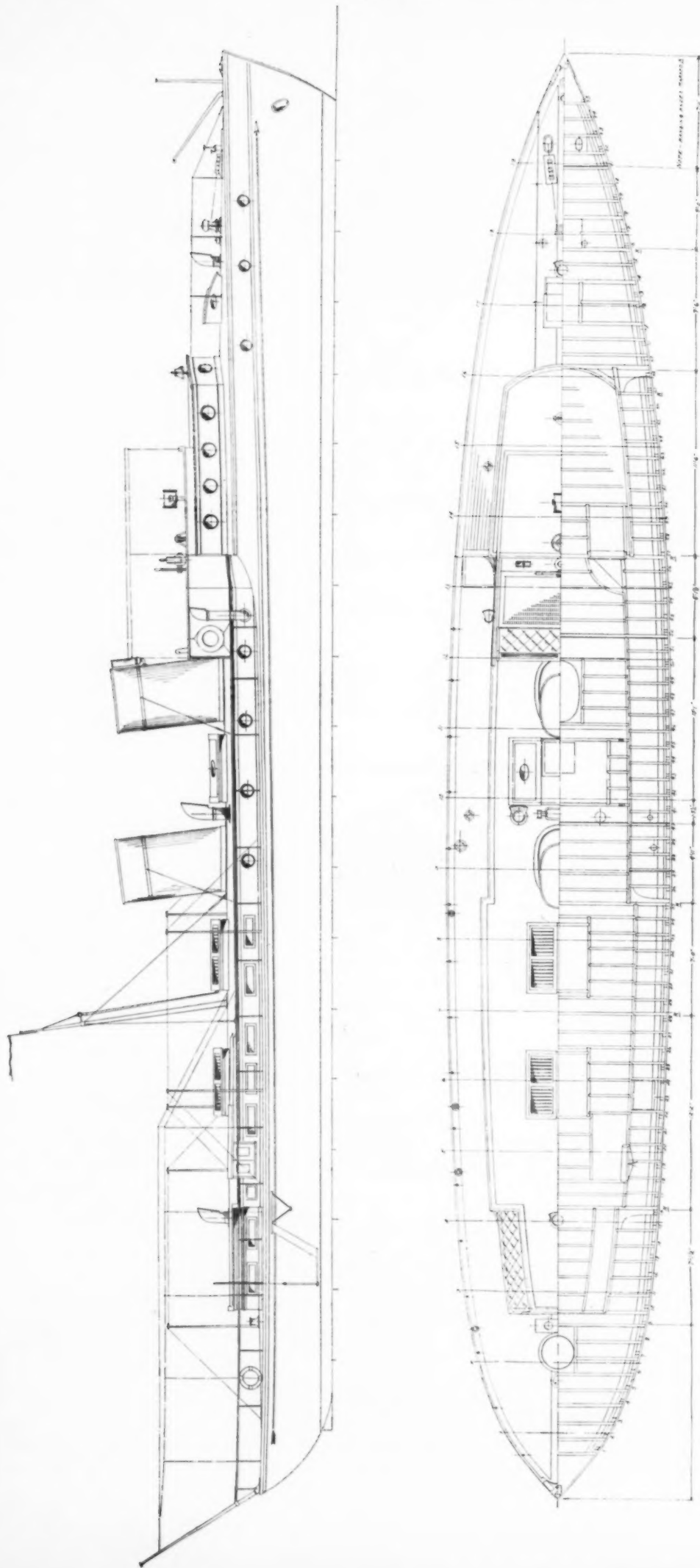
down and stowed.

In addition to this protection above deck, a windshield is fastened to the forward end of the bridge, so that ample protection may be afforded to the steersman in unpleasant weather. This shield is arranged to swing up out of the way when its use is not a necessity.



A complete illustrated description of this auxiliary schooner, designed by Bowes & Mower, will be found upon pages 32 and 33.





Navigator has low, graceful lines and with her two stacks she gives an appearance of speed combined with seaworthiness. She is a radical departure from the usual type of power craft.

## "Navigator," a 90-Header for New England Waters.

A TWIN-SCREW power cruiser, the plans of which are shown upon the accompanying pages, has recently been designed by Swasey, Raymond & Page, Inc., of Boston, for Mr. Charles J. Davol, of Providence, R. I., who expects to use the vessel in Narragansett Bay and other New England waters.

The over-all length of this craft is 89 feet 6 inches, and she has a beam of 14 feet and a draft of 4 feet 6 inches. Her accommodations include, aside from

the crew's quarters and engine room, a galley, 2 staterooms, an after cabin and a large bathroom.

The crew's quarters occupy the forward part of the vessel and consist of 4 berths with locker space and shelves in the forecabin. A crew's toilet with lockers is forward of this.

Aft of the forecabin is the forward cabin which extends above the deck and furnishes space which is used as a dining-room. It is provided with a semi-circular seat at the forward end and an extension

table in the center. Lockers are arranged along both sides and a sideboard is built in at the after end. A companionway leads from here up to the bridge deck, and upon the port side a staircase leads down to the galley which is a few steps below the floor level of the dining-saloon.

This galley extends the full width of the vessel, and is completely equipped with stoves, ice-boxes, hot-water tanks, etc. Aft of the galley is the engine room in which are installed 2 6-cylinder Murray &

Tregurtha engines of 65 horsepower each at normal speed.

Dynamo space is provided upon the starboard side and lockers extend along both sides above two 300-gallon gasoline tanks. A special locker is also provided for the engineer. At the after end of the engine room are shelves, a pipe berth and work-bench and a wash-bowl.

Aft of the motor room is a large bathroom completely fitted, opening from the owner's stateroom.

speedy appearance to the craft, and furnish space to place the whistle apparatus, exhaust from the engines, water tanks, etc. Two additional water tanks, one of 100 gallons and one of 180 gallons, are placed below the floor and the midship section aft of the engine room, and another water tank of 150 gallons' capacity is placed under the floor of the forward cabin.

This vessel is very similar to Milwin and Remlik III, both of which were designed by this same firm. The interior decorations have been carefully planned in order to give an artistic effect, the forward cabin being finished in mahogany and the after quarters in white with tapestry panels.

The guests' stateroom is finished with gold tapestry panels and the owner's stateroom in white with tapestry of old rose.

The after cabin is designed to give the effect of the

wardroom on a large vessel and is very distinctive in type; it is large enough to accommodate all the guests and furnishes a comfortable lounging place.

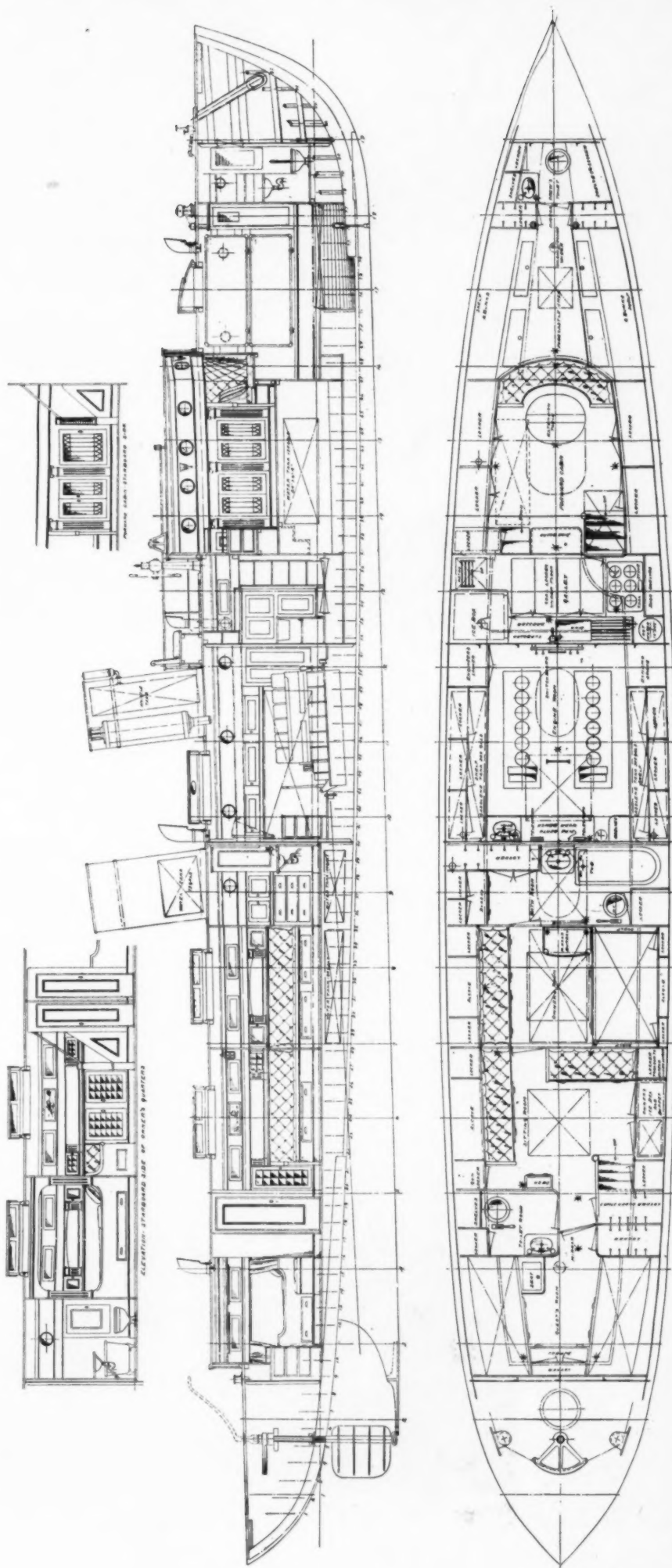
This craft is a good example of the present trend of large cruisers, the design showing a complete departure from the old steam yacht practice, where the hulls were built very high and clipper stems were considered the only proper construction for a boat over 50 feet in length. The present trend as shown by this craft seems to be toward low hulls with straight lines, and low but strongly constructed decks.

The motor-room equipment of this vessel is worthy of note, since it is as complete for its purposes as that of an ocean liner. It is placed just forward of the midships and is protected both forward and aft by watertight bulkheads. One of the

stacks communicates directly with this room, and the other communicates with the bathroom aft and provides ventilation for that section of the vessel.

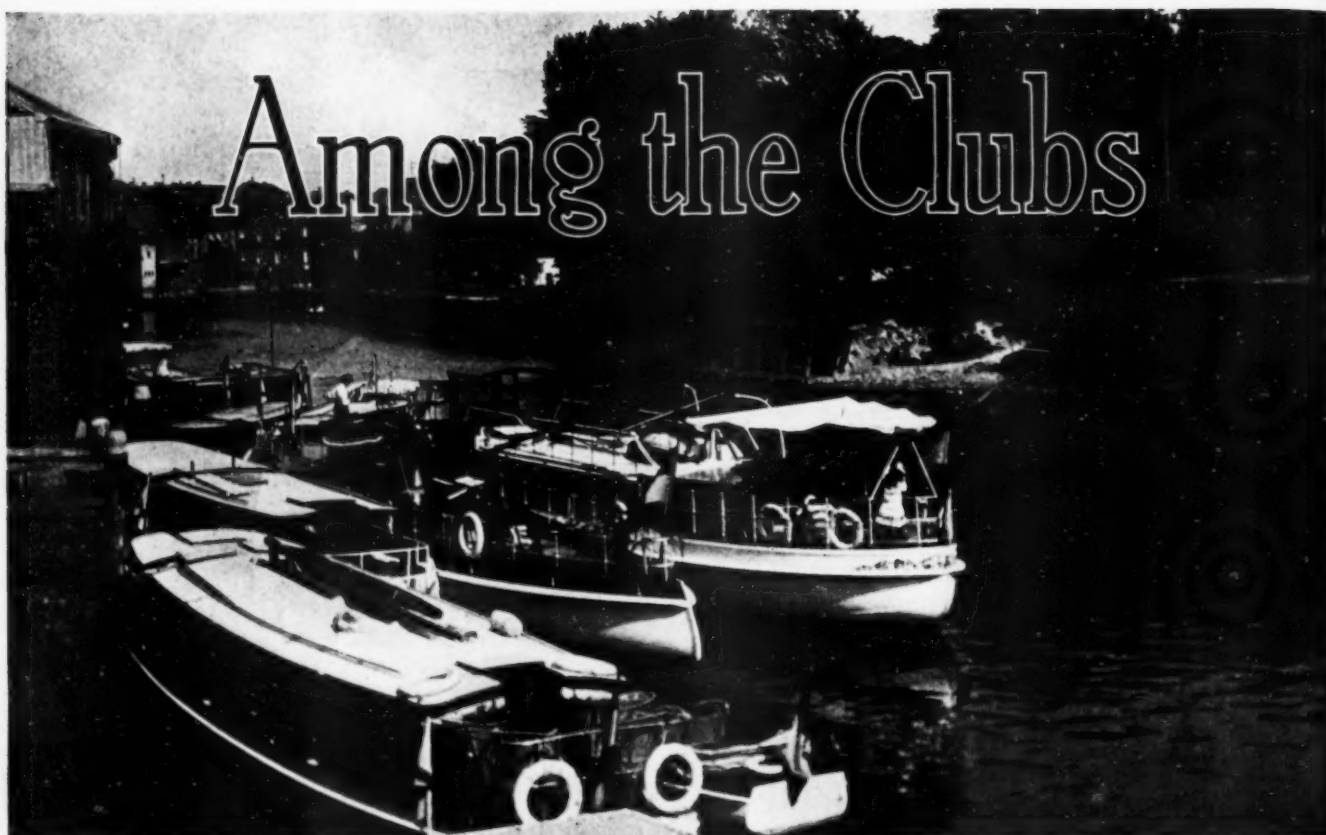
An elaborate lighting plant is installed, the small stars throughout the plane showing the location of the electric light fixtures. The switchboard is at the forward end of the motor-room, and a complete workshop is installed so that any necessary repairs may be made at short notice.

The stern is of the canoe type, but the sections are so balanced that the vessel will not draw down at the stern even when under full speed. The overhang of the stern gives additional deck space upon which chairs may be used, and in addition to this there is available space along the sides of the cabins. An awning will cover the bridge deck and the entire after deck as well.



The below-deck arrangements of Navigator are most convenient and provide comfortable accommodations for parties of considerable size. Her engine-room is protected by watertight bulkheads.





Motor Boating in Germany. Reliability Trip of the German Motor Boat Club to Brandenburg. Boats moored outside the Hotel "Stadt Koenigsberg" at Potsdam during the distribution of prizes.

**The St. Augustine Power Boat Club**, of St. Augustine, Fla., has announced that the "Southern Championship" races will be held this season on April 3rd, 4th and 5th. These races were held last year under the management of Chas. F. Hopkins, Jr., the secretary of the club, and were the most successful ever held in the South, both in the number of entries and in the exciting finishes. Mr. Hopkins used a handicapping system of his own, which has been found highly satisfactory by all who have raced under him. Commodore J. Stuart Blackton, of New York, has signified his intention of entering his "flyers" in the coming races, which will make the event even more interesting. Mr. Hopkins will handle the races this year and will be glad to hear from any boat owners who are interested. His address is Box 696, St. Augustine, Fla.

**The Williamsburgh Yacht Club**, at a regular meeting held in December, elected the following officers for the coming year: Commodore, John G. Wilson; vice-commodore, A. Kling (re-elected); rear-commodore, N. Bock; treasurer, A. W. Treybal; secretary, William S. Richards (re-elected); fleet captain, Harry F. Beck, and fleet surgeon, Dr. A. Ziegler. The club is about to enter upon the 42nd year since its organization.

**The Pensacola Yacht and Motor Boat Club**, of Pensacola, Fla., elected the following officers for 1912 at the annual meeting held December 27th: Commodore, Thomas C. Watson; vice-commodore, C. M. Jones; rear-commodore, P. Lindenstruth; fleet captain, R. B. King; fleet lieutenant, C. H. Witherell; secretary, R. B. Hargis; treasurer, W. K. Hyer, Jr.

**The Excelsior Yacht Club**, of Brooklyn, N. Y., at the annual election held December 21st, elected and installed the following officers for 1912: Commodore, Thomas Trolsen; vice-commodore, William D. Martin;

rear-commodore, John J. Smedley; recording secretary, George Moore; financial secretary, C. D. Olmstead; treasurer, Andrew Beyer; measurer, E. J. Holzman; fleet captain, Chas. Ericson; fleet surgeon, Theodore Halvorsen; chaplain, Louis Ronalter; trustees, Messrs. Hewitt and Cornell for three years in place of Messrs. Bonick and De Voss; E. J. Holzman for two years, unexpired term of Thomas Trolsen.

**The Kill Von Kull Yacht Club**, of Bayonne, N. J., has elected the following officers for the coming year: Commodore, Joseph B. Smith, of Bayonne, N. J.; vice-commodore, Jaffrey Buchanan, of Newark, N. J.; rear-commodore, John Ball, of Elizabeth, N. J.; secretary, Edward Smith; treasurer, John Gilbertson; fleet surgeon, Dr. L. F. Donohoe; fleet captain, John B. Cowper; measurer, John J. Higgins; trustees, for two years, John Gibson; for one year each, John Cowper and Benjamin Laubenheimer, all of Bayonne.

**The Fall River Yacht Club**, of Fall River, Mass., at the annual meeting held January 4th, elected the following officers for 1912: President, John A. Crowley; commodore, Frederick Webb; vice-commodore, Charles M. Freeborn; rear-commodore, Thomas L. Bartlett; secretary, Frank Rivers; treasurer, Charles H. Davis; measurer, Herbert M. C. Skinner; di-

rectors, John Dixon, F. H. Gooch and Henry R. Read.

**The Taunton Yacht Club**, of Taunton, Mass., held its annual meeting December 14th, at which the following officers were elected for the coming year: Commodore, Joseph Williams (re-elected); vice-commodore, Lewis M. Witherell; rear-commodore, Samuel G. Wilkes; treasurer, Frederick E. Goff; secretary, A. H. Ryder. The club has entered upon the new year with a membership of 338, a fleet of 88 craft of various descriptions enrolled and a sound financial status.

**The Albany Yacht Club**, of Albany, N. Y., elected officers as follows for the coming year at the annual meeting held January 6th: Commodore, Matt McCarthy (third term); vice-commodore, C. R. Butler; fleet captain, Harry B. Willard; fleet surgeon, B. E. Kinne, M.D.; measurer, Geo. C. DuBois; secretary, Victor C. Heidrick; treasurer, Thomas T. Bissell; board of governors, John E. Scopes (two years), and Wm. De Meyer (two years).

**The Branford Yacht Club**, Branford, Conn., at its recent annual meeting, held at the home of the retiring secretary, H. M. Perry, at Short Beach, elected the following officers for 1912: Commodore, Wm. T. Flanders; vice-commodore, Dr. D. V. Burdge, of New Haven; rear-commodore, W. H.

Sperry, of Short Beach; secretary and treasurer, Joseph Bussman; trustees, Messrs. Tyrell, Sperry, Rice, Weissbath and Samuelson.

**The Cleveland Power Boat Club**, of Cleveland, Ohio, has announced the results of its recently completed racing season. The season has been a very successful one, both in the number of boats participating and the closeness of the contests, due in a large measure to the excellent handicapping in the starts. In Class B, open boats under 20 feet, the championship was won by Peerless, owned by Henry



German Motor Boating. Boats on Club Run to Teupitz waiting to pass locks at Koenigswusterhausen.

Gottschalt. Scout, last year's champion, owned by Percy Stoller, finished a close second; and Vixen, owned by Fred Nichols, Mildred D. owned by Robert Drews, and Alice, owned by A. R. Ferris, are the others who finished in this class. The championship in class C, open boats, over 20 feet, went to Zampa, owned by Ferd Eiche. Dalguthae, Haeefe brothers, finished second with the following in the order given: Loafer, H. Harvey; Gray Lady, E. Herbert; Mauna Loa, Clyde Stewart and Edna R. Carl Rose. Phyllis, the seaworthy cruiser, owned by Carl Graves, won the championship in the cabin class, and Paul Erdman's Tramp, George Huberty's Red Feather and Henry Squires' Swastika followed close to the leader. The crack speed boat Traveler, owned by George Dietz, not only carried off the championship in the club races, but also won the Ohio State Championship Flag.

**The Byram River Yacht Club**, of Port Chester, N. Y., elected the following officers at the annual meeting held January 4th: Commodore, Dr. S. J. Brooks; vice-commodore, Chas. F. Hess; rear-commodore, Arthur E. Chandler; fleet captain, Warren E. Martin; secretary-treasurer, Louis C. A. Lewin; fleet surgeon, Dr. John J. Lewin; trustees, Warren J. Martin (term ends 1913), Joseph T. Hubbard and Edward G. Faile (term ends 1914).

**The Pastime Boat Club**, of Louisville, Ky., has elected officers for the new year as follows: President, W. J. Imrode; vice-president, W. L. Martin; secretary, E. A. Gnau; treasurer, V. K. Ecker; captain, F. B. Boyer; launch director, C. J. Kerbel; tennis director, H. A. Veeneman; baseball director, R. C. McBride; directors, J. J. Gaffney, B. H. Imrode and G. B. Carney. The club has large grounds and a handsome club house on the Ohio River, just east of Louisville.

**The Louisville Boat Club**, of Louisville, Ky., at a banquet held at the Seelbach Hotel, discussed plans for the erection of a \$15,000 club house to be built on the River Road, about 1½ miles east of the Water Works Pumping Station. This property was recently acquired by the Louisville Boat Club Realty Company, a holding corporation for the boat club, with a capital stock of \$10,000. There are 12 acres on the site, 4 of which will be used for club purposes and the other 8 leased to individuals, principally club members, who will erect bungalows. On the grounds is an old-fashioned 12-room residence, which will be remodelled. Major William A. Colston, president of the club, acted as toastmaster, and among those who responded to toasts were: Dr. George H. Day, John M. Whyne, William E. Pilcher and Dr. Gaylord C. Hall.

**The Pistakee Yacht Club**, of Pistakee Lake, Ill., has given formal recognition to the value of feminine influence in club affairs by appointing four women to serve on the house committee. Last year there was some complaint about the management of the club house and the directors felt that if they permitted the wives of the members to share the labors of the house committee, the buildings and grounds would be kept in better condition. Accordingly, Chas. E. Carson, the new commodore, has appointed the following women members of the committee: Mrs. F. H. Miller, vice-chairman; Mrs. Minnie MacRoberts, Mrs. John Reebie and Mrs. Chas. Reed.

**The Buffalo Motor Boat Club** is getting out a very good little club magazine entitled, "The Log." It is issued monthly and is filled with club news, both grave and gay. Besides the interesting reading matter, there are attractive cuts of motor boats, principally of the speed variety, notably a view of the 26-foot monoplane, Wigwam II.

A bright little club paper is the "Log Book" of the **Bayside Yacht Club**, which fully makes up in quality for whatever it may lack in quantity. That does not mean that it is so very diminutive either, for there are 15 pages full of live club news and clever little items of interest to the members. The paper is issued monthly.

The year book of the **Detroit Motor Boat Club**, containing the history, constitution, by-laws, house rules, membership and fleet enrollment, has been received. It is safe to say that

many clubs might go further and fair worse than to take this for a model. A very attractive feature of the book is found in the numerous cuts of club members, club craft, etc., among which is a handsome frontispiece showing the club's beautiful home.

**The New York Yacht Club** at its annual meeting held December 21st, in the club rooms, reelected all its flag officers for the coming year: C. Ledyard Blair, owner of the steam yacht Diana, is the commodore; Dallas B. Pratt, schooner Sea Fox, is the vice-commodore, and George F. Baker, Jr., steam yacht Viking, the rear-commodore of the club. The other officers are: Secretary, Geo. A. Cormack; treasurer, Tarrant Putnam; measurer, Wm. Hallock. Regatta committee: C. Sherman Hoyt, J. M. MacDonough and De Berkeley Parsons. There were 200 members present, of which 37 were yacht owners and 21



Cups won by Emma L. owned by Mr. R. V. Letts, of North Wildwood, N. J., equipped with a 7-h.p. Eagle motor.

regular, and 16 navy members were elected at the meeting.

**The Detroit Motor Boat Club** at its annual meeting, held on December 11th, elected the following officers: Commodore, William E. Scripps (reelected); vice-commodore, W. J. Gordon; rear-commodore, E. P. Gray; secretary, G. W. Graves; treasurer, A. D. Maguire; fleet captain, J. K. Webster; fleet surgeon, Dr. W. D. Ford; measurer, E. M. Emmons; quartermaster, M. H. H. Von Jasmund. Commodore Scripps addressed the meeting and urged a campaign to increase the membership to 1,000. The club finished the year with 500 members.

The third annual regatta of the **Great Lakes Power Boat League** will be held under the auspices of the Royal Hamilton Yacht Club on August 7th, 8th and 9th. This League is composed of some fourteen clubs bordering on the Great Lakes, both in the United States and Canada, and includes in its membership owners of some of the fastest boats in America. Hamilton has been selected as the place for the meet because of its beautiful bay, which affords one of the finest sheets of water in the country for power boat racing. No pains or expense will be spared to make

a great success of the three-day event and it is hoped to have a greater assemblage of boats than at any previous regatta. The seven-day Scripps Cruise will finish here on the afternoon or evening of August 7th. The events will be run in the following order: First day, at 2 P. M., five-mile race for boats with two cylinders or less; 3 P. M., two-mile free-for-all race; 4.30 P. M., ten-mile handicap race; 5.30 P. M., aquaplane demonstrations. Second day, 11 A. M., 40-foot class; 2 P. M., 26-foot class; 3.30 P. M., 20-foot class; 5 P. M., 40-foot displacement. The distance for each of the above classes will be 20 miles and three prizes will be offered in each event. Third day, 10 A. M., cruisers, 14 miles, Hamilton to Bronte and return, three prizes; 11 A. M., 32-foot class, 20 miles, three prizes; 2.30 P. M., annual International Motor Boat Handicap Race, 20 miles, four prizes; 4.30 P. M., Great Lakes Power Boat Championship, 25 miles.

Vice-Commodore J. Stuart Blackton, of the **Motor Boat Club of America**, has announced that he will offer a beautiful and valuable cup, to be known as the Blackton trophy, for the Southern Championship races of next Spring. The cup is to be contested for by boats of not less than 20 miles speed.

**The Corinthian Yacht Club**, of San Francisco, Cal., has elected the following officers for 1912: Commodore, E. J. Convey, of the Yacht Mischief; vice-commodore, H. E. Picker, of the Yacht Harpoon; port captain, John H. Keefe; directors: H. W. Westerfeld, C. F. Morel, W. G. Hogg and J. F. Campbell; secretary, H. W. Westerfeld, and treasurer, C. F. Morel.

**The New Brunswick Motor Boat Club** is a recent organization of New Jersey. Twenty-six enthusiastic motor boat owners were enrolled at the initial meeting, held in December. The club has decided to build a clubhouse on the Highland Park side of the Raritan River.

**The Toledo Power Boat Club**, of Toledo, Ohio, opened its new Bay View Park clubhouse on December 20th. The club is in a more prosperous condition than it has ever been before. The floating debt has been wiped out and within a month, thirty new members were added to the enrollment. There were fifty members present at the opening of the clubhouse and brief addresses were made by Vice-Commodore R. M. Starr, of the Inter-Lake Yachting Association; Councilman C. J. Sievert, Harbor Master A. J. Page and others.

**The Newark Motor and Yacht Club**, of Newark, N. J., held its annual election January 4th, at which the following officers were chosen: Commodore, Jos. P. Kroll; vice-commodore, Clarence Wentworth; rear-commodore, Everett Bradley; secretary, Albert P. Guerin; financial secretary, John J. Beatty; treasurer, Harry Breckenridge; measurer, Charles Klink; trustees: John B. Chenoweth, Charles F. Montaloo, Harry H. Harrison, Henry Kieferdorf, Harry Balfour and Louis Werner.

**The Rochester Yacht Club**, of Rochester, N. Y., recently elected the following officers to serve for the coming season: Commodore, C. R. Pullen; vice-commodore, William L. Glenn; fleet captain, Dr. W. F. Plumley; treasurer, George V. Fleckenstein; secretary, C. E. Noxon; fleet surgeon, Dr. Henry T. Williams; directors for two years: George F. Loder, C. H. McChesney, E. J. Benedict and Thomas B. Pritchard; for one year: Homer Knapp, William Brink and Wilson H. Cross.

**The Seawanhaka Corinthian Yacht Club**, of Oyster Bay, Long Island, has elected the following officers for 1912: Commodore, August Heckscher, steam yacht Anahma; vice-commodore, Harold S. Vanderbilt, schooner yacht Vagrant; rear-commodore, Daniel Bacon, sloop yacht Avenger; secretary, George Nichols; treasurer, Colgate Hoyt, Jr.; measurer, Alexander M. Orr; trustees, Frank S. Hastings, Edward F. Whitney and Franklin A. Plummer; regatta committee, George E. Roosevelt, Harold Mestre, Everett Dominick, Eliot Tuckerman, Nelson Doubleday; committee on lines and models, John Hyslop, Robert L. Cuthbert, Alexander M. Orr,



Mr. Koerner, president of the American Power Boat Ass'n, sends greetings from Japan.



# From Motor Boating Readers.

A Department for the Exchange of Ideas and the Discussion of Questions of General Interest.  
Editorial Opinion on a Number of Questions Submitted by Readers of the Magazine.

MoToR BoatinG's columns are open to its readers, not only for asking questions, but for placing before other readers ideas, results of experience, opinions, etc., that should be interesting or helpful to them; but the editor will not, of course, be responsible for any opinions expressed or statements made in such communications. The name and address of the writer must necessarily be given in every case to make an answer by mail possible (no anonymous contributions will be considered for publication), but names will be omitted in publishing the letters and answers where desired, in which case it is desirable that initials or other distinguishing signature be appended. Through the correspondence department readers of the magazine may be of direct aid to one another in solving the problems of motor boating.

## Pointers on the Choice of Propellers.

To the Editor of MoToR BoatinG, Sir:—

Since the season closed the writer has had occasion to measure a large number of boats hauled out for the winter, for the purpose of prescribing new propellers, and I find that in a very large proportion, especially among cabin cruisers and among heavily constructed boats generally, the design will not permit of using the proper diameter propeller. This is true not only of amateur designed boats but also of some of those of the largest manufacturers of stock boats.

A simple rule that works out pretty well is as follows: For light boats allow for propeller diameter 6% of the length, for heavy-weight craft, 8%. (A medium-weight 35-footer might be described as follows: Planking  $\frac{3}{8}$  inch, ribs 1 foot x  $1\frac{1}{2}$ -inch, interior finish  $\frac{1}{2}$  inch, engine weight 1,600, design ordinary cabin cruiser type.) It is possible to design a boat using a propeller in diameter but 4% of the length of load waterline, but the construction and engine must be very light and power low. Those who have had experience with propellers know that nothing hurts the performance of an outfit like a propeller that is too small. To obtain best results the diameter must be determined by the boat and the pitch by the engine. Very few cabin cruisers have power enough to use more than 1:1 pitch ratio and 60% of them would give best results on 1:0.8 pitch ratio.

A simple rule for determining the proper pitch is to take the propeller of 1:1 pitch ratio that the engine will turn at 700 revolutions and use this pitch with whatever diameter the above formula calls for. For twin screws the diameter should be 70% of the single screw diameter as given by the formula. Of course, to obtain maximum results the diameters and pitches should be calculated by one that understands the use of the complex formulas, but the above formulas will give very good results with the average boat and engine.

SCHUYLER BULL, Rochester, N. Y.

## A Criticism from Russia.

To the Editor of MoToR BoatinG, Sir:—

In the June number of MoToR BoatinG there was an article by Mr. H. H. W. Keith on "Choosing the Right Propeller." For the purpose of estimating speed of a boat, the author gives the following formula:

$$M = C \frac{\sqrt[3]{L \times P}}{B}$$

where  $M$  = speed of boat in miles per hour,

$L$  = length over all in feet,

$B$  = extreme beam in feet,

$P$  = brake horsepower of engine,

$C$  = a coefficient varying somewhat with the type of boat.

Then, about the different values of  $C$ , Mr. Keith says:

"For cruisers,  $C = 9$  to 11; for runabouts,  $C = 8$  to 10; for high-speed boat,  $C = 8$  to 9."

I suppose there may be a mistake in these words. Really, if we imagine three boats of the same  $L$ ,  $P$  and  $B$ , but of different types mentioned above, we may see from the given formula that the value of  $M$  depends entirely on the value of  $C$ ; the greater is this coefficient

types, such as cruisers and work boats.

V. A. YASTREBTSSEFF, Samara, Russia.

## The Answer.

To the Editor of MoToR BoatinG, Sir:—

In regard to the criticism by Mr. Yastrebtsseff, of the formula for approximating speeds of motor boats given in my article on propeller dimensions in the June issue of MoToR BoatinG, I offer the suggestion that a little consideration of the proper proportion of length to beam in the three different types of boats might help him out of his difficulty. In his letter he says: "If we imagine three boats of the same length, power and beam, but of different types, etc." This requires considerable imagination as to where the difference in type comes in, also it is hard to conceive the wide beam found in cruisers being used for a high-speed boat of the same length and horsepower. The reduction in beam gives the increase in speed of the faster

boat. Generally speaking, runabouts and speed boats are seldom over forty feet in length. Comparing fast boats of this length with the forty-foot seagoing cruiser, we find that the beam for the high-speed boat may be about five or six feet, for the runabout about six or seven feet, while for the cruiser it could be as much as nine or ten feet. The cruiser needs the large beam to insure sufficient stability and safety in rough water, and also to provide accommodations for living on board. In the fast boat these qualities are sacrificed for the sake of speed, so that the beam naturally can be reduced.

Mr. Yastrebtsseff is right in saying that the formula should be worked backwards in order to obtain values for " $C$ ," but it is also necessary for me to state again that only data from boats of the same proportions as the design in hand should be used. It is not expected that the formula will give accurate results in all cases, but if reasonable care is taken in its use, it will be found sufficiently exact for the design of propellers in normal types of boats.

HENRY H. W. KEITH, Boston, Mass.

## Too Much Pitch.

To the Editor of MoToR BoatinG, Sir:—

My boat is a raised deck cruiser, 31' x 7' 8", about 28' x 7' on the water line and 30" draft. The hull has a fairly easy entrance and run, the stern being a rather narrow compromise. Weight of boat about 8,000 lbs. The engine is a Goshen, 2-cyl., 2-cycle, 5" x 6", 3-port machine, and turns a propeller which I think is 19" diameter by 28" pitch, 470 r.p.m. This propeller was cut down from one 20" diameter. This drives the boat about 8 miles per hour. This figures out about 56% propeller slip, which seems extremely high to me. Would you recommend a different propeller? One of perhaps greater diameter and less pitch.



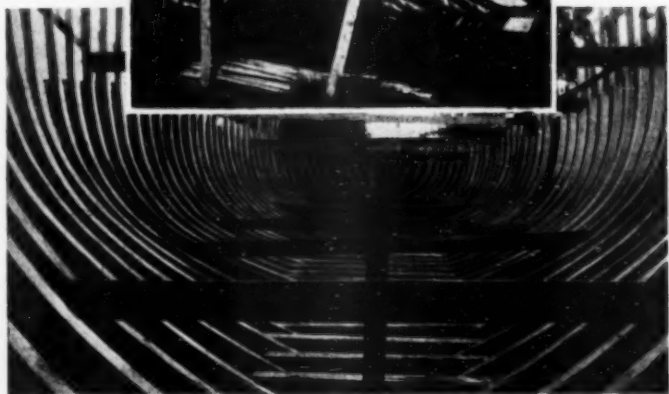
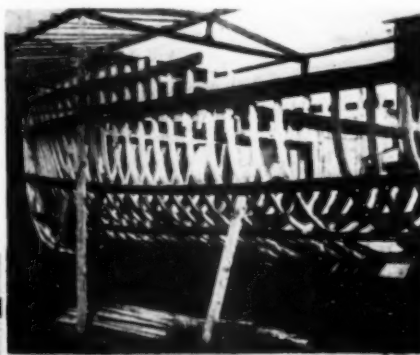
Idylkrest was built by a reader of MoToR BoatinG from the article on "How to Build a V-Bottom Runabout," which appeared in the March, 1911, number.

—the greater is the speed. But according to Mr. Keith, cruisers have the greatest coefficient and speed boats the least; therefore, cruisers must run with equal length, beam and horsepower—faster than speed boats—which is absurd.

So the persons interested in such calculations would do better not minding these values of  $C$ . One had much better determine  $C$  by another formula given by Mr. Keith:

$$C = \frac{B \times M}{\sqrt[3]{L \times P}}$$

It may be seen from this formula that  $C$  is greater with speed boats and less in slower



A 45 ft. x 10 ft. 6 in. raised deck cruiser being built by a 21-year amateur from a knockdown frame. It will be noticed that one rib was left out for convenience in getting in and out, but was put in before planking.

Propeller is of course three-blade. The largest diameter that can be swung is 23". Also, in your opinion would the propeller you recommend increase the speed of the boat? In a fair-sized sea the speed is cut down to 7 miles per hour or less. It seems to me a larger propeller of less pitch would enable the boat to maintain a little higher speed in a seaway.

L. V. B. G., Chicago, Ill.

ALNC

[By the formula — we get about 12

750

horsepower for your motor, and everything considered, we believe your propeller is too small in diameter and too heavy in pitch. A 22 x 24 wheel should give better results, cutting down the slip materially and possibly boosting the speed a little above 8 miles.—Ed.]

## A Waterproofing Formula.

To the Editor of MoToR BoatinG, Sir:—

Below is given method of waterproofing canvas by the alum and sugar of lead process. This also renders canvas nearly mildewproof.

Dissolve ½ lb. alum in two quarts of boiling water, then add two gallons of cold water. Let canvas soak in this solution for a day. Dissolve four ounces sugar of lead in two quarts boiling water and add two gallons cold water. Take canvas from alum water, wring lightly, and place in lead solution. Leave in this for six hours, wring lightly and hang on line to dry.

B. BREWSTER.

## Advantages of Dory and V-Bottom.

To the Editor of MoToR BoatinG, Sir:—

I am contemplating building a 30-foot raised deck cruiser. My requirements are: first, safety and seaworthiness; second, a maximum amount of room; third, economy in construction with reasonable amount of speed.

Will you please advise me of the advantages and disadvantages of the dory and V-bottom boats as compared with the conventional type?

S. H. JONES, Chicago, Ill.

[Both the dory and V-bottom types are considerably simpler in construction than the conventional carvel built boats, and the ease of construction more than overbalances the advantages of the latter boat for the man who is doing his own building. The dory, however, if the original type is maintained, is rather a crude model for so large a boat as a 30-footer. Furthermore, while of extremely seaworthy shape, its stability is rather poor, due to the narrow bottom, and while the type is being extremely modified by a number of dory man-



Fair Haven was built in the backyard.

ufacturers, the improvements add to the difficulty of building. We are, therefore, inclined to recommend the V-bottom type which is very stable and can be made as seaworthy as a boat of the conventional type. This boat is probably the simplest model to build, is more easily driven than the dory and can be given wide beam without greatly increasing the resistance to propulsion.—Ed.]

## Regarding Twin Engines.

To the Editor of MoToR BoatinG, Sir:—

As a subscriber to your magazine I would like you to give me your opinion on the following, as I intend building a cruising boat this winter:

I have two gasoline engines (5¼" x 6", 2-cylinder, 4-cycle Lamb, 500 revolutions) that I want to use with 22" twin screws, and supposed to give 12 h.p. each. Would they be equal or better than a 4-cylinder, 24 h.p., if of the same make? That is to say, would the two engines give me the same speed as the single 24 h.p. or more speed? Would it be advisable to let both propellers turn in the same direction or in the reverse of one another? Can

one engine be made to turn in opposite direction from the other by changing the valve cams? At present they both turn in the same direction.

What is the proper direction for propellers to turn, to turn both toward the center of boat or toward the sides, and what would be the proper distance apart for the center of both propellers, say in a boat 45 ft. long of 10 ft. beam? N. A. MORANO, New Orleans, La.

[Considering the fact that you are building a cruising boat, we believe that one 4-cylinder engine of 24 h.p. at 500 revolutions would be superior to two 12 h.p. engines at the same revolutions. In the first place, there is a saving in weight of 450 lbs. and a larger wheel can be used which is an advantage. In case twin screws were used the engines should rotate outboard. Both engines rotating the same way give a turning moment which has to be compensated by using the rudder and thereby decreasing the speed. Propellers should have at least 2" clearance from the hull, or in case of flat-bottom boats the tips should clear each other by 2". The valve cams on the Lamb engine cannot be changed to alter the rotation of the engine.]

## Another V-Bottom Built to MoToR BoatinG's Designs.

To the Editor of MoToR BoatinG, Sir:—

Finding so much that is interesting and instructive in every copy of MoToR BoatinG I am inclined to write you of the practical help given me in the March number of this year.

I have been interested in the V-bottom boat for some time, but the occasion for building did not present itself until about the middle of the summer, when I set to work—"with hammer and saw"—and in less than eight weeks Fair Haven was launched.

I added about three feet amidships, making the boat a trifle over twenty-five feet in length. This is exactly the length that experience has shown me I needed. She is made of ¾" white pine for the planking and white oak keel and ribs. Decks are poplar, canvas-covered.

I used asphaltum on the outside up to the waterline, and all of the interior is painted with it. Screws and bolts were used exclusively in the construction up to the decks, which were nailed on.

The engine is a two-cylinder, two-cycle, 5" x 5" Fox, and drives the boat about fifteen miles an hour with four people on board.

The photos give a good idea of the boat, and, considering weight, speed and seaworthiness, she cannot be beaten.

E. B. ALBERTIN, Huntington, W. Va.



A triumphal procession—Fair Haven, the V-bottom runabout that E. B. Albertin built from the design which appeared in MoToR BoatinG, on the way to her launching. Note the uniform interest of the small boys in the foreground, the conscious and somewhat suppressed elation of the men, and, last but not least, the proud bearing of the horse.



# New Things for Motor Boatmen

## Hagstrom Priming Cup.

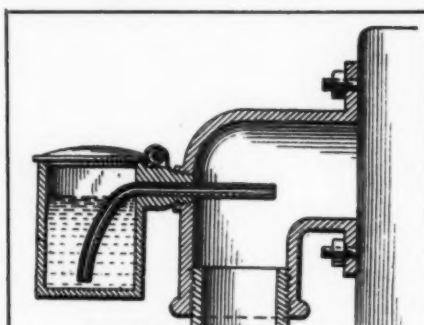
The Hagstrom priming cup is of the automatic suction type, and is in reality merely a cylinder primer which acts almost automatically. It consists, as the illustration shows, of a small cup which is filled with a small quantity of gasoline, and which is drawn into the intake manifold at the first turn of the crank. It is sucked in with such force that it is converted into a perfect mixture which ignites instantly without in any way neutralizing the lubrication of the cylinder. The primer is made from solid brass, and has no valves or delicate mechanism. It is usually attached to the intake pipe and holds enough fuel to run the engine until the carburetor has had a chance to act properly. There is no explosive force against it, and the lid fits so tight that no gasoline can be spilled. The cup has also been found very useful in cutting carbon from the cylinders by using kerosene instead of gasoline. The cups are sold for \$1.00 each and are made by the Hagstrom Brothers Mfg. Company, of Lindsburg, Kans. \* \* \*

## The Stanley Mixer.

The Stanley Mixer is a simple automatic attachment which is placed in the intake manifold of the motor between the carburetor and the engine, and which when set into motion by the suction of the intake so thoroughly agitates the stream of gasoline and air that the mixture is very finely divided and rendered very easily explosive. It consists of a short flanged tube in the end of the intake pipe with an agitator mounted on a ball-bearing shaft so as to rotate freely within the tube. The agitator is made of stiff wire formed into a short metal coil and provided with a pair of slightly tilted blades which rotate similar to a propeller. The gasoline furnishes sufficient lubrication for this device, and its operation saves a large proportion of fuel which is otherwise wasted by being burned uselessly without being properly mixed to provide an explosive mixture. It is not affected by changes in temperature and it can be installed without alteration, upon any standard intake pipe. It is handled by Charles W. Jacob & Allison, 18 Cedar street, New York City, and sells for \$5.00. \* \* \*

## General Electric Transforming Devices.

The General Electric Company, of Schenectady, N. Y., have recently placed upon the market a number of devices which can be used to convert gas or oil lamps into electric lamps, using current furnished by a storage battery. The bayonet base socket bracket and the 6-inch reflector for converting gas lamps is attached to the gas pipe in place of the burner and is held in position by means of brass nuts. The lamps may be focused by screwing the reflector backward or forward on the socket. It is readily accessible by merely opening the head of the lamp. The reflector is nickel-plated and is in the form of a true parabola. The bayonet base candelabra socket for converting oil lamps into the electric can be attached to the oil burners without disturbing them and can be so adjusted that when the bulb is removed the socket does not interfere with the oil flame. A 3-circuit snap switch is also made in the flush type, which can be wired over any of a number of combinations of lights for cabin illumination. Extra terminal connections are provided so that an electric whistle may be attached to it. A number of new switches have also been designed, both of the flush-tumbler type, the service-tumbler type and push-button switches. These are so arranged that the number of levers used is reduced and the control of the lights is thereby simplified.



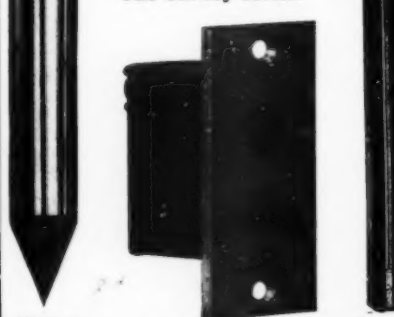
The Hagstrom priming cup.



The Miller emergency gun.



The Stanley mixer.



X-Ray Indicator.

The G. E. flush switch.

Safety gasoline rule.



The Sonora horn.

## Miller Emergency Gun.

The accompanying illustration shows the internal arrangement of parts of one of the latest grease guns placed upon the market by Miller & Starr, 1779 Broadway, New York City. The operation is very simple, it being necessary only to unscrew the plug No. 15 and screw the discharge spout 14 into sleeve 13. The handle is then turned to the right until the piston is stopped by the flange 28 when the gun will be emptied. To fill the gun the plug is unscrewed from the cap and the piston may then be moved with the shank to the opposite end of the barrel. Cap No. 11 may then be removed to fill the gun and when filled, the handle is turned to the left, until the plug engages with the socket of the cap No. 12. After use the discharge spout may be removed and replaced with the plug, when the gun is ready for placing in the tool kit for future use.

## Safety Gasoline Rule.

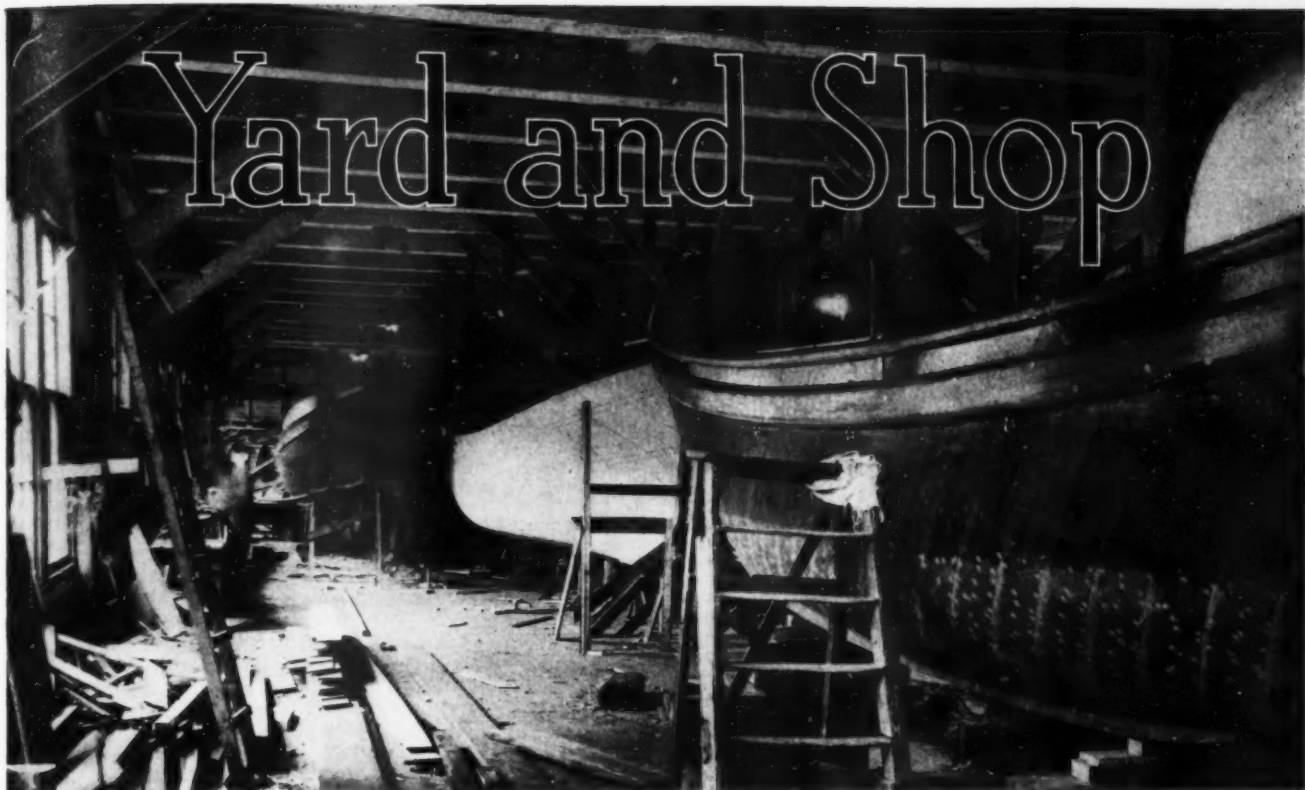
A useful device for the motor boatman has recently been brought out by the Jeannette Auto & Machine Company, of Jeannette, Pa., in the shape of a measuring device for gasoline tanks, as shown in the accompanying illustration. It is called a Safety Rule because no light is necessary in the vicinity of the tank when using the rule, since the cork float stays at the gasoline level until it is released. For convenience, the device may be carried under the seat, as it is no larger than an ordinary ruler, and it cannot be crushed from sitting on it. To measure the gasoline, it is necessary only to press the rule together at the top, insert it in the tank, and release the pressure at the top. The cork will then remain in the rule at the gasoline level. The price is 25 cents. \* \* \*

## The X-Ray Indicator.

This indicator is sold by A. R. Lamberson & Co., of Albany, N. Y., and is designed to locate any trouble in the ignition system. The spark plugs may be examined without removing them from the motor and weak ignition may be distinguished in an instant. Since all spark plugs are provided with a spark gap which is normally open when the plug is in good condition, the potential raises every time the spark jumps across the gap. When the strength of the current is great enough to jump across this gap it is also sufficient to show a glow in the indicator which is visible every time the spark jumps between the points. If no glow is seen in the indicator the strength of the current is not equal to the resistance of the indicator and any difficulty with the ignition system may at once be ascertained. To operate, it is only necessary to apply the pointed end to the terminal of the spark plug and look through the sight hole of the indicator. The price of the instrument is \$3.00. \* \* \*

## Sonora Horn.

A Sonora Horn, made by the Sonora Motor Horn Company, 1741 Broadway, New York City, has been tested for a period of about six months, and is now being placed upon the market. This horn uses the smallest type of motor and, therefore, the current consumption while it is being operated, is very small. In fact, it is said that one set of batteries will operate this horn under ordinary conditions for a full season's use. There is no disc or diaphragm displacement in the operation of this instrument, so that a motor of comparatively small power will produce the sound. It is operated by striking an interposed member about an inch away from the center of the diaphragm, and this small spring member beats against the disc like a hammer at about 30,000 beats a minute. The list price is \$17.50.



Government lifeboats under construction at the Electric Launch Company's Works, Bayonne, N. J. The boat in the middle has received but one layer of planking and is being covered with canvas before applying the outer layer. An article telling about these boats appeared in January.

#### Change in Ferro New York Distributors.

The Ferro Machine and Foundry Company, of Cleveland, Ohio, has announced that since the first of the year, the Gasoline Engine Equipment Company, of 133 Liberty Street, New York City, has been the eastern distributor for the Ferro line of marine and stationary engines. The members of the Gasoline Engine Equipment Company are Messrs. C. Von Culin and W. H. Young, the former of whom was for several years a member of the sales force of the New York branch of the Ferro Company, until he formed a company of his own and went into business for himself. Mr. Young is well known in the east as a marine gasoline engine salesman. The company will carry a stock of Ferro engines and will exhibit at the New York Motor Boat Show.

#### An Interesting Opposed Motor.

The Davis Manufacturing Company, of Milwaukee, Wis., builders of automobile, truck and marine engines, have recently developed a  $6\frac{1}{2} \times 6$ , 4 cylinder motor, which has several interesting features. The engine weighs 2,600 pounds and will develop 46 horse power at about 600 revolutions per minute. The crank pin bearings are  $3\frac{1}{4}$  inches in diameter and  $3\frac{1}{2}$  inches long and the main bearings are  $3\frac{1}{4}$  inches in diameter, with the front bearings  $6\frac{1}{4}$  inches long and the rear bearings 8 inches long. The engine has a special oiling arrangement, by which about five gallons of oil are held in the base of the motor and this oil is forced into a pressure reservoir, located on the inside of the crank case by a gear pump in the base of the motor. From here the oil is con-

veyed to different parts of the engine and flows in a continuous stream onto the connecting rods and pistons at all times when the motor is running, requiring no attention other than occasional filling of the crank case. The lubrication is perfect no matter in what position or at what angle the engine is run. This system makes a clean engine and the company guarantees it to be smokeless. The Davis people also make the same type of motor with cylinder  $5\frac{1}{2} \times 5$  and  $8\frac{1}{2} \times 8$  inches. Besides these engines, especially adapted to marine work, the company manufactures a large line of opposed motors for traction engine purposes, trucks, etc. These include cylinders  $4\frac{1}{2} \times 5$ ,  $5 \times 6\frac{1}{2}$  and a ball bearing engine  $4\frac{1}{2} \times 4\frac{1}{2}$ , all of which can be run up to 800 revolutions per minute. The last two would make very satisfactory marine motors.

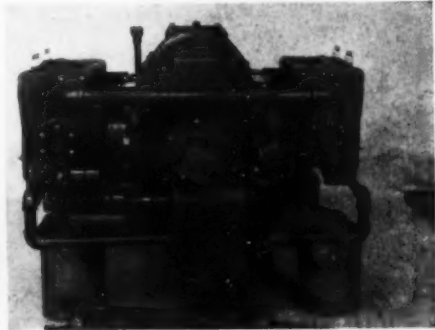
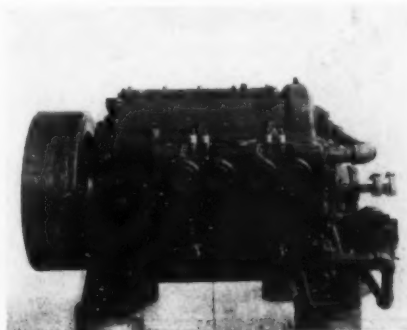
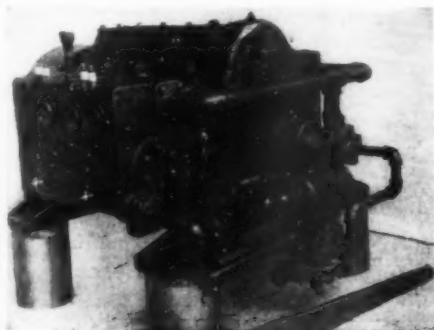
#### New Office for Philadelphia Storage Battery Company.

The Philadelphia Storage Battery Company has opened a new New York office in the American Building, Broadway and Columbus Circle, to accommodate more satisfactorily its increasing business in electric vehicle and motor boat lighting batteries and storage batteries of other types used in the trade. The office is in charge of Walter L. Thompson, the company's New York representative.

#### Smith & Baldridge Machine Company Make Changes.

The Smith and Baldridge Machine Company, of Detroit, Mich., have increased their capital stock to \$100,000 in order to handle comfort-

ably their increasing business. In addition, they have changed their name and home address. In their four years' business existence under the old name, so many of the dealers formed the habit of designating them as the "Baldridge Gear Company" from their well-known Baldridge reverse gear, that it was thought best to adopt the more natural and convenient title. The officers and management, however, remain unchanged. Last fall, the company moved to their new factory situated on the main line of the Michigan Central Railroad and extending through from the West Grand Boulevard to Roosevelt Avenue, Detroit. The new factory is entirely on the ground floor, but provision has been made for additional stories when the future expansion of the business makes more room necessary. The rapid growth of the company's business has made an annual increase in its facilities necessary since the first year the Baldridge gear was put on the market, and each year the increased demand has so far outstripped the company's facilities that more or less delay in filling orders resulted. Accordingly, the company has taken time by the forelock this season and accumulated a large stock of gears to take care of the spring rush. The past year has been a very successful one and the efficiency of the company's product is shown by the fact that so far as the company knows, there has not been a single case of dissatisfaction with their 1911 machines. The gears for 1912 will be of the same general design as those of last year, although it is probable that some small changes will be brought out from time to time as fast as they are developed and prov. to be

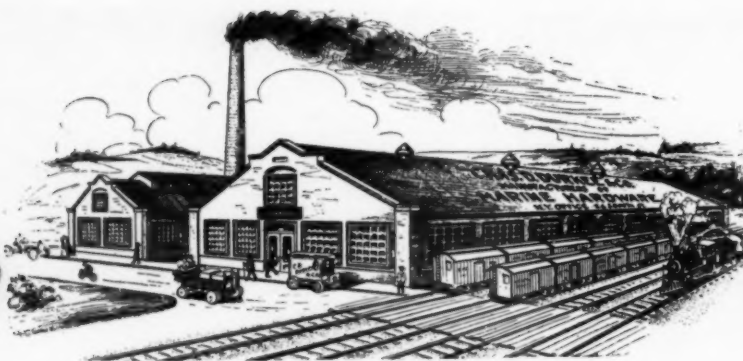


The Davis four-cylinder, four-cycle opposed motor, with cylinders  $6\frac{1}{2}$  by 6 inches, develops 48 H.P.





Chas. D. Durkee.

The New Factory of Chas. D. Durkee & Co.  
near Stapleton, Staten Island.

Wm. H. Durkee.

valuable. The retail prices will remain the same as in 1911.

#### Supply Company Changes Quarters.

George B. Carpenter & Co., of Chicago, Ill., manufacturers and jobbers of marine supplies and motor boat accessories, have announced that after the first of the year they may be found on the corner of Wells and Michigan Streets. The new premises cover a half block, with a total floor space of approximately 150,000 square feet. For the past 40 years, the Carpenter store, located on the corner of Fifth Avenue and South Water Street, has been a landmark on the Chicago River, but with the rapid growth of business, one department after another was forced out and compelled to find space either in the company's factory building, Illinois and Wells Streets, or in their warehouses at Indiana and Orleans Streets. The growing inadequacy of the South Water Street building to meet the demands of the trade, decided them on the change and they will now be able to consolidate several departments which have hitherto been separate. The storage warehouse at Indiana and Orleans Streets will be continued.

#### Y. M. C. A. Starts Navigation Course.

The New York Nautical College, now a part of the educational work of the West Side Young Men's Christian Association, 318 West 57th Street, has inaugurated a special course on navigation, which should be of interest to every motor boat owner in New York City. The course will include sailing by chart, the phenomena of the magnetic needle, boxing of the compass, explanation of variation, deviation and local attraction, determination and amount of compass-error, by aid of terrestrial ranges; also the nomenclature of charts in the way of the scale, true and magnetic compasses, lights, soundings and danger marks. The work of chart sailing will cover the questions of shaping the course and measuring the distance between the points by the use of parallel rules and dividers, finding the vessel's place by day and by night according to the cross bearings and bow and beam bearings with deviation as a factor, calculations for tidal current sailing and for time courses. The rules of the road for sail and motor boats, their lights, fog signals and whistles will also have attention. The Nautical College was given to the West Side branch by several New York millionaire yachtsmen and has equipment valued at \$25,000.

#### Engine & Boat Agency Outgrows Quarters.

The continued growth of the business of Bruns Kimball & Co., Inc., has compelled the firm to again enlarge its New York office and showrooms. Finding their quarters at 134 Liberty Street too small, they have moved one door east to 132 Liberty Street, where the largest stock of new and second-hand engines probably ever exhibited in New York by any one firm will be found. The Jersey City shops and warehouse of the company have also been enlarged to meet the demands for the coming season and are now being stocked with both two and four cycle engines ready for prompt delivery during the spring. A special storehouse has been taken for the storing of engines ordered at this season of the year for spring delivery. The Bayonne winter storage yard and repair shops at the foot of East 39th to 41st Streets have likewise been improved, making it possible for the company to do repair or installing work at short notice and at reasonable prices. A low rate of winter storage has been established, so as to enable boat owners to have their boats properly taken care of through the winter season at a moderate cost. This, in connection with their large brokerage department, enables Bruns Kimball & Co. to give their clients the best of service and easily sell any boats which may be sent to the yard for that purpose. The following well-known makes of engines are on display at the New York showroom or carried in stock: The Sterling new model, 4-cylinder, 25 to 32 H. P., as well as the newly designed 1912 model, 130-h.p. racing machine; the Eagle 2-cycle motors, in any size and quantity, prompt delivery guaranteed, so that purchasers may not be troubled by the delay caused last year by the failure of the output to meet the demand; Campbell 4-cycle engines; Perfection 2-cycle engines; San Francisco Standard 4-cycle engines; the popular indispensable motor boat devices, the Perflex ignition system, magnetos and carburetors, Hyde propellers, reverse gears, shafting, stuffing boxes, spark coils, and other things pertaining to engine equipment. The firm will accept old engines of any manufacture as part payment for new and larger machines.

#### New Boat Company in Milwaukee.

A new firm has been incorporated in Milwaukee, Wis., known as the Milwaukee Yacht & Boat Company, with a capital stock of \$20,000. James B. Welch, Chas. A. Melchand and F. W. Magin are the incorporators. The com-

pany has taken over the business, plant and equipment of the Eastern Boat Building Company and is making extensive enlargements and improvements. Launches and runabouts will be built from 18 to 27 feet and cruisers from 27 to 36 feet in length. The company is also prepared to submit bids on any type or size of speed boat or cruiser and will also make a feature of the storage and repair of boats. James B. Welch is president of the company.

#### Another Marine Hardware Company Moves.

The A. S. Morss Company, of Boston, Mass., dealers in marine hardware and fittings, have moved to 43-45 High Street, Boston, after having been at 210 Commercial Street for 67 years. The new store is in the center of the hardware district and the salesroom and office is on the street floor. The salesroom measures 110 by 25 feet and is fitted up so as to give customers prompt and satisfactory service. A full stock of goods arranged for convenient handling will be carried and samples of heavy goods will be displayed. The machine shop and warehouse will be located near the store and the shipping department on the Purchase Street floor, convenient to the express offices. The A. S. Morss Company was one of the first to make yacht hardware from its own designs and patterns.

#### A Reverse Gear of a Different Type.

The Carlyle-Johnson Machine Company, of Manchester, Conn., manufacturers of the well-known Johnson Marine Reverse Gear, which was first put on the market in 1902, have added to their line a new gear of an entirely different construction, with which they have been experimenting for several years and after having tested this type thoroughly in actual installation in their own boats for two years, are now prepared to market it on a large scale in the coming season. The new Johnson gear is radically different from any makes now on the market, which are mostly of the planetary type. Like all their previous designs, this gear is completely encased as a protection against sand or grit getting into the working parts and as a precaution against oil or grease being easily spattered about the boat, and as a further means of preventing this last trouble, the main shaft bearings are fitted with stuffing boxes on each end of the gear case. A nest of spur gearing (Fig. 1) is incorporated within a clutch body or gear cage, on each end of which are mounted clutch members of the Johnson type of clutch. These gears run on four hardened shafts, each end of which is supported in the ends of the gear cage. The gears are always in mesh with

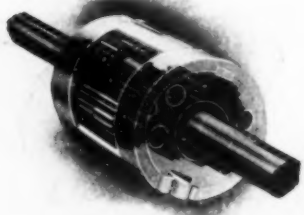


Figure 1.



Figure 2.



Figure 3.

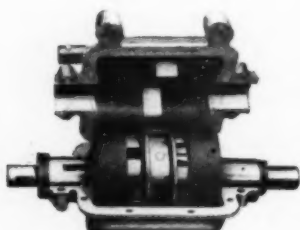


Figure 4.



Figure 5.

The above figures show the construction of the new Carlyle Johnson reverse gear.

the engine and propeller shaft pinions, the latter extending to the right and the former to the left in the figure, each being supported in bronze bearings in the ends of the gear cage and extending through far enough to be coupled onto. The gearing and shafting are small in diameter in order to keep the construction compact, but are made of vanadium steel, oil treated, thus giving these parts the strength of a cast iron or machine steel gear several times as large. On each end of the gear are expanding friction rings (Fig. 2) of hardened steel, with a set of toggle levers in each diametrically opposite for use in expanding the rings. These rings expand in friction cups (Fig. 3), which surround the rings. One pair of the toggle levers can be seen through a section of the friction cup. Spaced midway on the clutch body is the shipper sleeve, with two hardened, curved-shaped wedges riveted in it, one being shown in perspective and the other diametrically opposite. These wedges force the levers apart, thus expanding the rings, bringing their outer surface into frictional contact with the inner surface of the friction cups. The leverage is so compounded that it requires but little pressure to operate the clutches. The adjustment is very simple, as one screw which moves two taper blocks set into the base of the toggle levers adjusts the contact of each ring and cup to any tension. This screw is easily reached by a screwdriver through a hole in the friction cup and reverse gear cover. Fig. 4 shows the double clutch construction outlined above installed in the bottom half of the gear casing. The hub of the friction cup on the right is keyed on its outside diameter to the bottom case and is bronze bushed, through which the propeller shaft runs. The hub of the other friction cup is free to revolve in the casing, which is bronze bushed, while the engine shaft extends through it and is keyed therein. In the top half of this casing is shown the shipper fork, which operates backward and forward to throw the shipper sleeve to forward, reverse or neutral position, as desired. The sliding rod controlling this shipper fork is also shown on the left top of the upper case and in Fig. 5 is shown connected to the reverse gear handle. The neat, compact design of the entire exterior is well shown in this last cut as the maximum height is only 7 inches and length to end of case bearings, 99-16 inches, in the 10-H. P. high-speed size. The reverse is two-thirds the forward speed and the gearing is made of material the strength of which cannot be questioned. It is absolutely noiseless in any position, easily installed and operated and guaranteed for one year if properly installed and used for power within its rating.

#### New Philadelphia Agency for Columbian Propellers.

The Columbian Brass Foundry have announced that they have made arrangements with Messrs. Carman and Bowes, of the Machinery Department, Bourse Building, Philadelphia, to represent them in that locality. A large stock of propellers is carried there and all ordinary sizes can be furnished from stock.

#### Credit to Whom Credit Is Due.

We regret to say that an error of considerable size was allowed to creep into our recently published MoToR BoatinG Trade Directory which was the occasion of the J. H. Curtiss Company, 2 South Street, New York City, being omitted under a long list of yacht plumbing supplies and accessories when the company should have been included as dealers



Bruns Kimball & Co.'s new showroom at 132 Liberty Street, New York City. Mr. Bruns is shown in the insert in the upper left-hand corner and Mr. Kimball in the lower right-hand corner.

in this line. Below are the headings under which the J. H. Curtiss Company should appear in addition to the names given. Bath room furnishings, closets (water), connections (water inlet and outlet), lavatories (folding and stationary), marine plumbing supplies, port lights, port light screens, pumps (bilge) hand, scuppers, stoves (alcohol), stoves (coal), stoves (kerosene), tanks (air), tanks (gasoline and oil), valves (pump), ventilators, pumps (galley), pumps (basin).

#### Another 40-Foot Cruiser.

Dr. James Ayer, of the New York Yacht Club, has just ordered from the yards of William Haff, of New Rochelle, N. Y., a duplicate of the cruiser shown upon page 45, which will be launched in April for Mr. H. C. Cushing, Jr., of the Columbia Yacht Club. This cruiser will also be equipped with one of the new six-cylinder motors with rotary valves, made by the Reynolds Motor Company, of Detroit, Mich.

#### A Rust-Proof Boat.

The Rippley Steel Boat Company, of Grafton, Ill., are constructing all-steel hulls from a specially made steel which, it is claimed, will not rust even in salt water. This fact should be of interest to foreign buyers in tropical climates, where a wooden hull deteriorates rapidly from the heat and water insects. The company have just moved into a large, new factory and are now erecting another building to meet the increasing demand for their product. The company builds motor boats, cruisers, fruit lighters, row boats and hunting boats, tenders and K. D. steel hulls, besides gasoline and air whistle tanks.

#### Accessories Companies Consolidate.

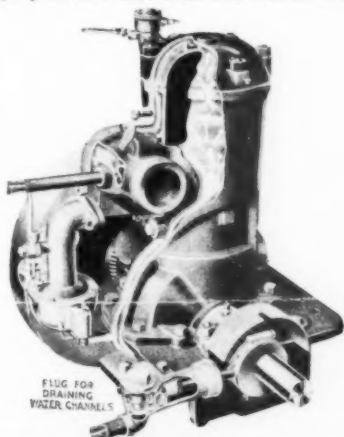
On the first of the year, Williamson Bros. Company, of Philadelphia, Pa., the American Ship Windlass Company and the Taylor Stoker Company, of Providence, R. I., consolidated under the name of the American Engineering Company. The manufacturing, sales and engineering departments of the several concerns have been concentrated at the works of the Williamson Bros. Company, at Philadelphia, which have been materially enlarged by the addition of a number of modern buildings, as well as the necessary special tools and equipment to enable the new company to build advantageously the products of the constituent concerns.

#### Elbridge Adds Magneto to Engine Equipment.

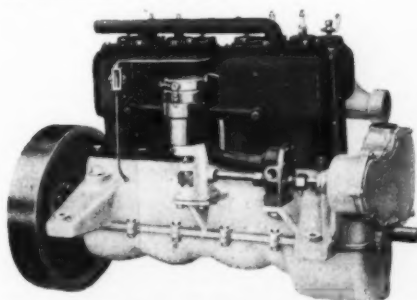
The Elbridge Engine Company, of Rochester, N. Y., have decided to equip their "Featherweight" engines with standard high-tension magnetos without extra charge. The company will install them on the type "A" and type "C" engines at prices ranging from \$10 to \$25, according to type. These outfits will include battery ignition.

#### The Kermath Four-Cycle Motor.

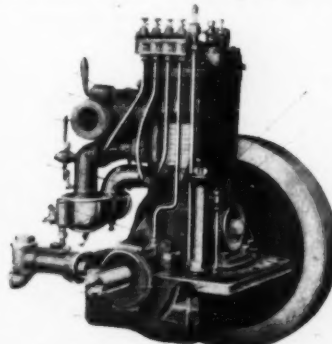
The Kermath Manufacturing Company, of Detroit, Mich., has put on the market a high-grade four-cylinder, four-cycle marine motor to meet the increasing demand from motor boat owners for an engine of this kind at a reasonable price. While the general principles of automobile engine construction have been followed, because the makers believe that the correctness of these principles has been effectually demonstrated, the manufacturers of the Kermath have not fallen into the error of assuming that an engine designed primarily for automobile use, possesses the necessary features of construction to insure satisfactory operation under strenuous motor boat service. They have, therefore, made the Kermath essentially a marine rather than an automobile motor. The engine is rated at 10 to 12 H. P. at 800 to 1,000 r.p.m. and weighs 330 pounds. The crankshaft is 1 3/4 inches in diameter, valves 1 3/4 inches, connecting rods, 9 inches. The motor has long pistons, three long main bearings, die-cast bushings throughout, enclosed tappets and valve stems, cams forged integral with the cam shaft and a simple and efficient lubricating system. The Kermath Manufacturing Company has as its general manager and designer, James Kermath, who built the first 1500 "Detroit Auto Marine" engines and has been manufacturing motors of every description since the beginning of the automobile and gas engine business in Detroit. The selling company is the Morton Motor Company, of Detroit, of which Harry D. Morton, formerly one of the organizers and general manager of the Gies Gear Company, is president. The vice-president, John B. Farr, was for several years with the Seattle branch of the Cadillac Motor Car Company. The Kermath is the result of 15 years experi-



Details of the Ferro cooling system. From the Ferro Treatise.



The New Kermath four-cylinder, four-cycle motor. Rated at 10 to 12 H.P.



Cut showing Ferro lubricating system. From the Ferro Treatise.



ence in motor manufacturing of a well-financed and well-equipped factory, of modern machinery and factory methods and of the making on a large scale of an engine of one type and size only, which meets the requirements of a large majority of motor boat users.

#### A Good Boat Name Plate.

The Hickok Manufacturing Company, of Rochester, N. Y., is putting out a boat name plate which should appeal to the fastidious motor boat owner. The designs are not only beautiful and suited to the boat on which they are to be placed, but they are absolutely distinctive. Outside of the original set, no duplicate can ever be made, since the design is destroyed in their making. They are sawed from heavy brass in one piece, thus insuring proper spacing of the letters and as one enthusiastic purchaser put it, "You don't have to monkey with a couple of thousand screws to get them on or off." They are really cheap, for the continual lettering of painted names mounts up in the end to a sum considerably higher than a set of these name plates and in addition, there is a satisfaction of having something rich in appearance and distinctive from the old style of lettering. The Hickok Manufacturing Company, 40 St. Paul Street, Rochester, New York, will be glad to furnish any further information about these plates and to quote prices. Judging from the tremendous demand of last season, which was the first of the Hickok name plate production, late comers may be disappointed.

#### Ferro Gasoline Engine Treatise Revised.

Those who have been following the motor boat sport for any length of time will remember the popular gasoline engine treatises published by the Ferro Machine and Foundry Company during 1907, 1908 and 1909. These treatises were published at 25c a copy and thousands of copies were sold not only in this country, but in all parts of the world. For the next two years, the publication of this book was discontinued, but for 1912, the Ferro Company has decided to bring out a revised and up-to-date edition. Much information has been added that is entirely new and which represents the result of extensive research on the part of the Ferro engineering and experimental departments. In order to make the

(Continued on page 75.)

## The High-Tension Magneto.

(Continued from page 33.)

the battery, acts simply as a source of current and must be used in connection with a vibrating spark coil and timer, the high-tension magneto is a complete ignition system in itself, requiring no spark coil, timer or battery. Whereas, the low-tension magneto can be mounted in any position, will run in any direction and can be driven by either friction, gear, belt or chain drive, the high-tension magneto will run in one direction only and must be driven by gears or chain in a predetermined relation to the crankshaft.

As before stated, the high-tension magneto is complete in itself, requiring no vibrating spark coil, timer or battery, as the high-tension current is generated directly in the armature coils. By this arrangement the wiring problem is made very simple, as it is only necessary to connect the magneto directly with the spark plugs on the engine. One low-tension wire is required to connect the cut-out switch used for stopping the engine.

The armature of the magneto carries two independent windings, one called the primary coil, consisting of a few turns of coarse wire, and the other called the secondary coil, consisting of very many turns of very fine wire. It is in the secondary coil that the high-tension current is generated. The timer is directly connected to the armature shaft and is an integral part of the magneto. The spark occurs at the instant the timer breaks the primary circuit. For use with multiple-cylinder engines, the magneto is provided with a distributor, which connects the magneto with the various cylinders in their proper firing order.

Particular attention should be paid to the installation of high-tension magnetos. It must be borne in mind that the magneto must run at a speed in definite relation to the speed of the

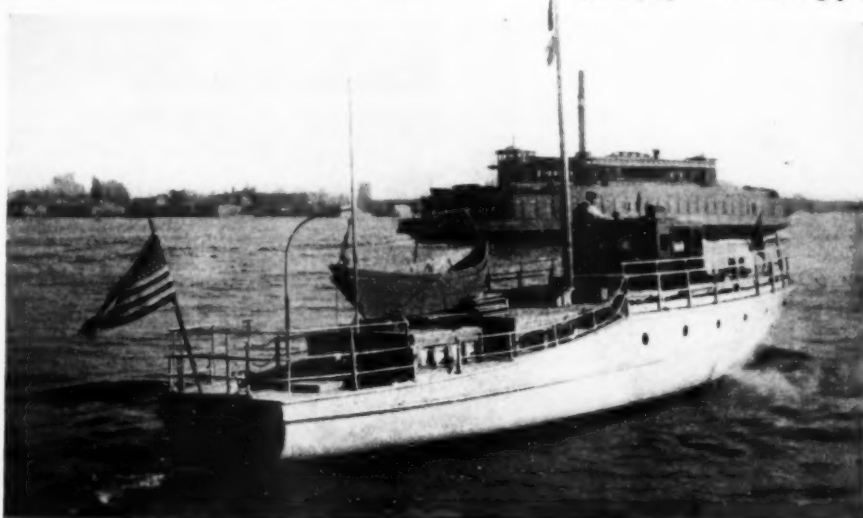
engine crankshaft, and therefore must be so located as to afford a direct and positive drive. The supporting bracket should be of brass or some non-magnetic material, as iron or steel placed under a magneto tends to reduce its output. The magneto should be rigidly fastened to the bracket and care taken that a good electrical contact is made between the magneto, bracket and engine frame in order that the grounded current can return to the magneto from the frame of the engine. Under no conditions use a non-conducting substance for a magneto support, as the current must have a return path to the magneto from the engine frame. Be sure that the magneto is in perfect alignment with the driving shaft, both horizontally and vertically.

The magneto is susceptible to moisture and oil and therefore should be kept as high above

the magneto has been in service for any length of time the revolving brush will wear, causing carbon dust to collect in the distributor. Short-circuits which will result in misfiring are liable to occur if this dust is not removed. The distributor cover should be removed at least once a month, if engine has been in constant service, and the interior wiped out with a soft cloth moistened with gasoline. Clean brush and see that it makes good contact.

Generally speaking, it is well to bear in mind that except for the simplest and most obvious repairs, it is far better to send the complete magneto back to its manufacturers in the event of its failure for any reason.

When trouble arises with the ignition system, the first step is to determine whether it lies in the magneto, wiring or spark plug. Too wide a gap at



Titania, one of the fastest fishing boats sailing from New York to the banks. Powered with two 36-h.p. heavy duty Buffalo engines. She is owned by the Titania Boat Co., of Hoboken.



The Alert, showing name plate made by the Hickok Manufacturing Co.

the engine base as possible, and in cases where installed in open boats, provided with a suitable cover of rubber, leather or brass. Locate the magneto as far away from the exhaust pipe as possible, preferably on the opposite side of the engine. Accessibility should be given due consideration, yet in many cases magnetos are so located and fastened that it is almost impossible to observe the action of the contact-breaker.

The high-tension magneto requires very little oil, several drops applied once or twice a month to the parts marked for oil being sufficient. Never oil the circuit-breaker or circuit-breaker mechanism unless for a drop of oil applied to the cam roller by means of a toothpick. Should oil get on the circuit-breaker contact points, it will cause them to spark badly and result in their destruction.

In regard to the contact points see that the amount by which they separate is always equal to the distance specified by the manufacturers of the magneto. In course of time these points will wear or burn, causing too great a separation between the point and imperfect contact. Examine from time to time, and if found to be rough file down to a flat, even bearing and adjust the distance. The point should bear evenly over their entire surface and not on a corner or edge.

Do not put oil in the distributor, as it will short-circuit the high-tension current. After

the plug points causes misfiring and this gap should not exceed 1/64 of an inch.

It will be noted here that the spark-plug gap is only one-half of the distance used for battery ignition. High-tension magnetos produce a spark of greater volume but of less voltage than the battery and coil system, consequently if the points of the spark plug are too far apart the compression in the engine cylinder will prevent the spark from jumping across the points. Special magneto plugs should be provided, used because of the intense heat of the spark, which will soon destroy thin wire points.

Examine the wires and see that they are securely fastened to their proper terminals. Make sure that the insulation of the wires is in good condition and free from oil or moisture. Never allow the wires to touch any metal part of the engine or come in contact with one another.

Should the trouble not be located in either the spark plugs or wiring, examine the circuit-breaker contact points and see whether they are in good condition. If pitted or burned, file them to a flat, even bearing. A faulty circuit-breaker will cause irregular firing and a dirty distributor will cause misfiring and also cause the engine to knock and stop suddenly. A broken or defective cut-out switch will cause the engine to stop suddenly by short-circuiting the primary current.

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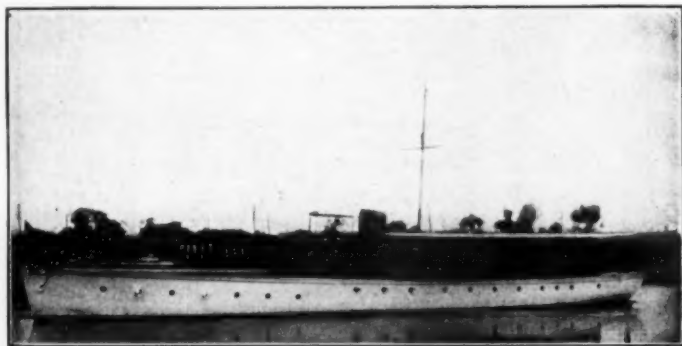
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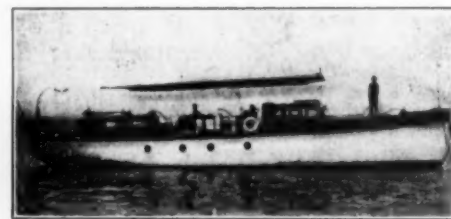
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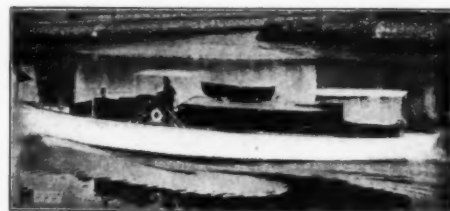


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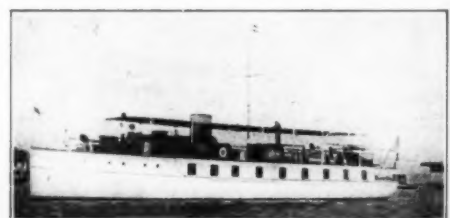
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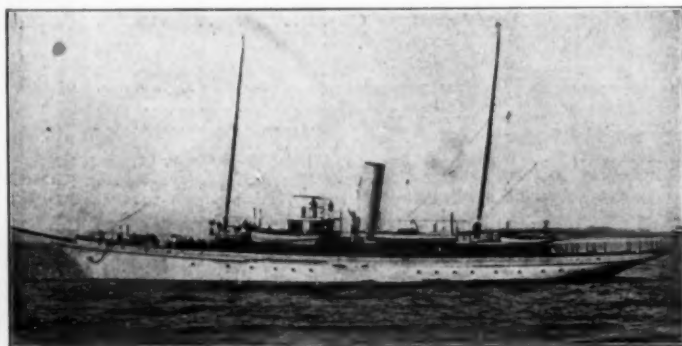
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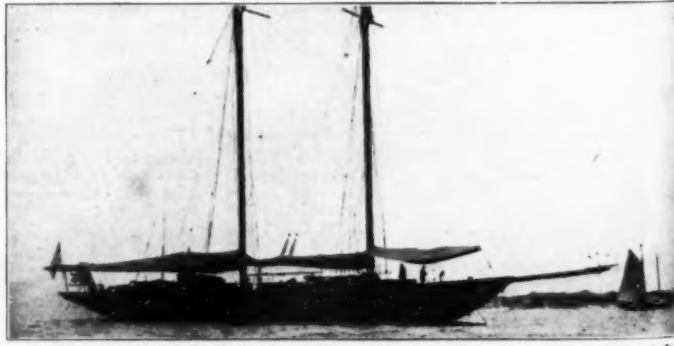
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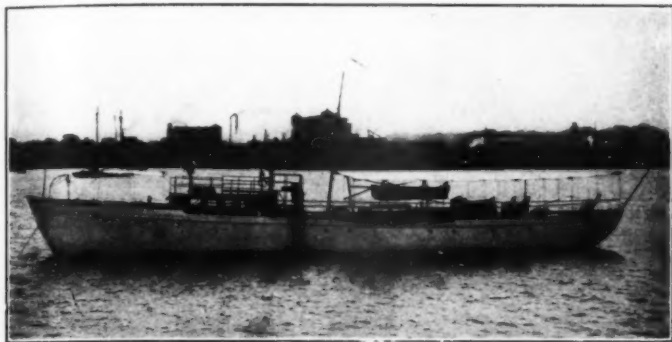
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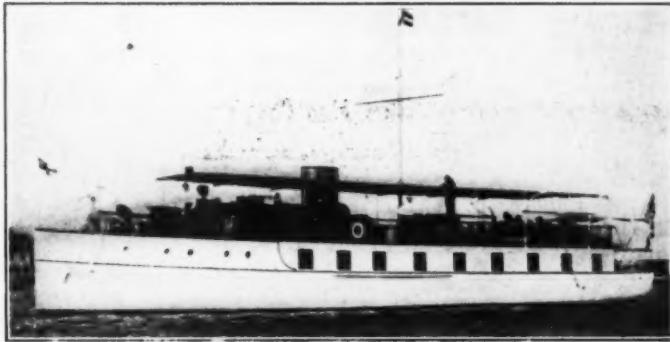
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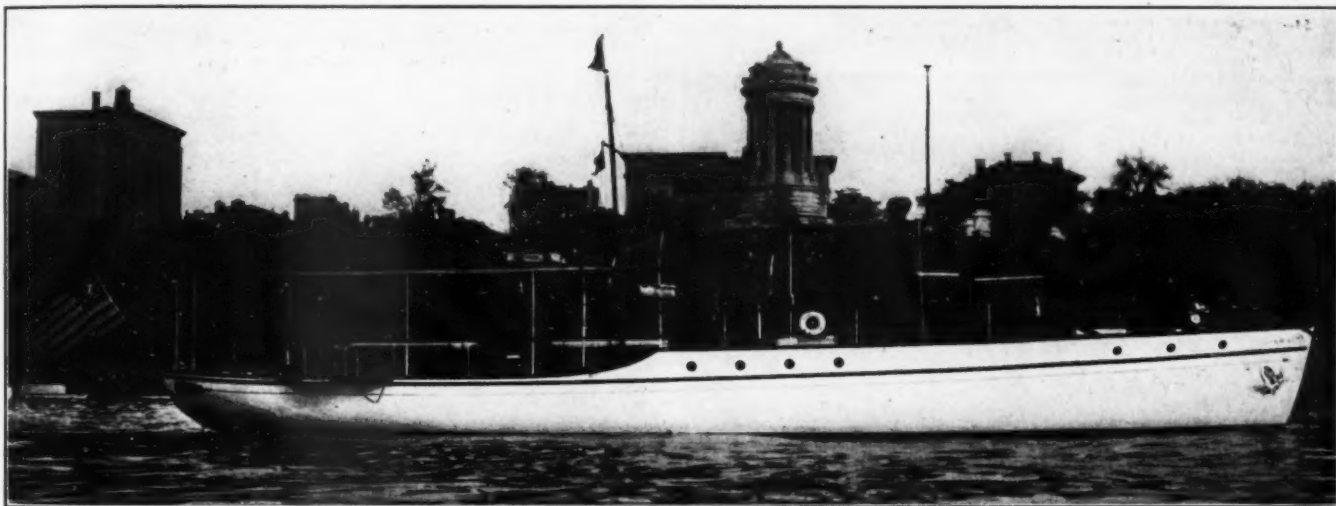
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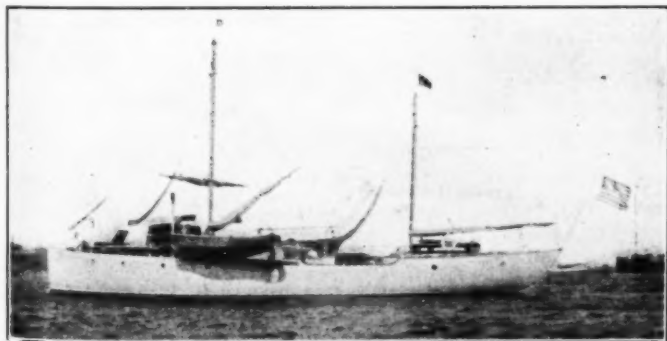
No. 6582.—96 feet; twin screw; 3 double staterooms, saloon; berth 9.



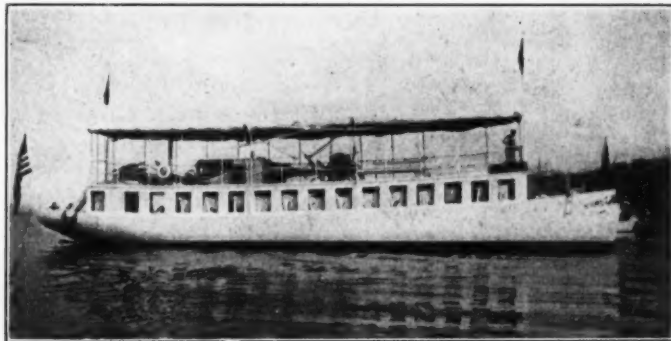
No. 6779.—90 feet; twin screw; 4 staterooms, 2 saloons and 2 baths; berth 11.



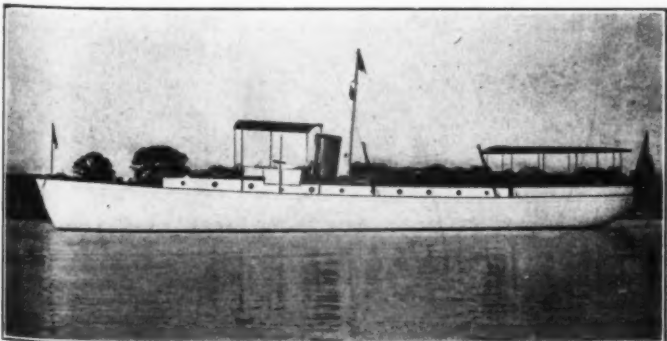
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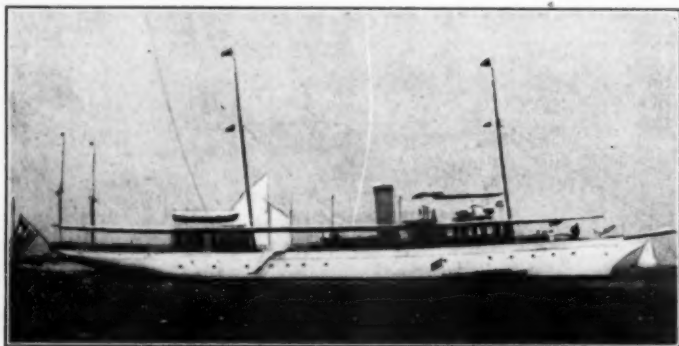
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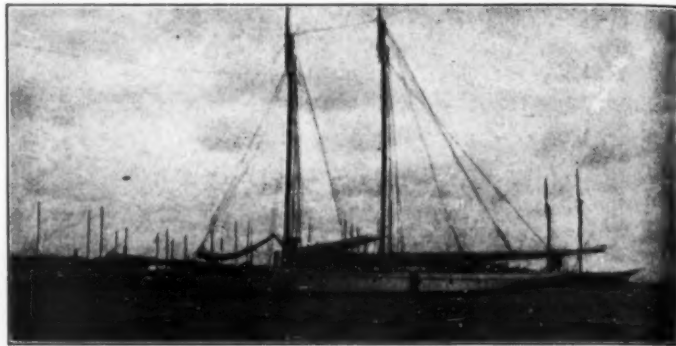
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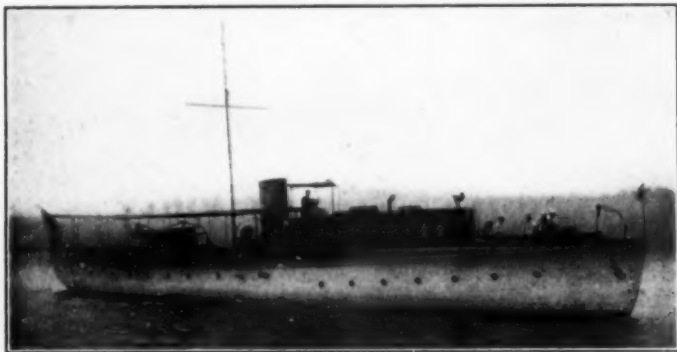
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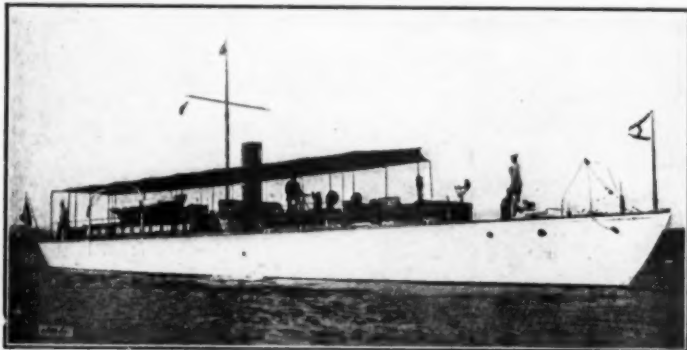
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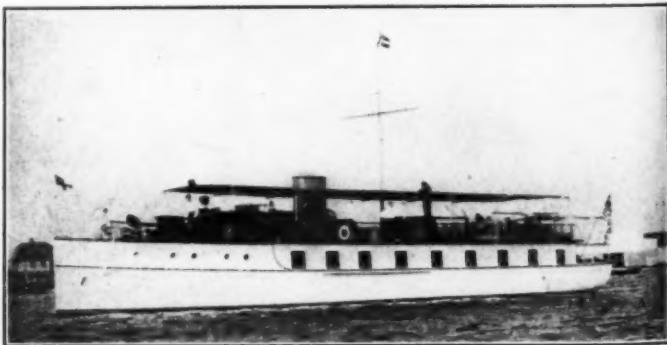
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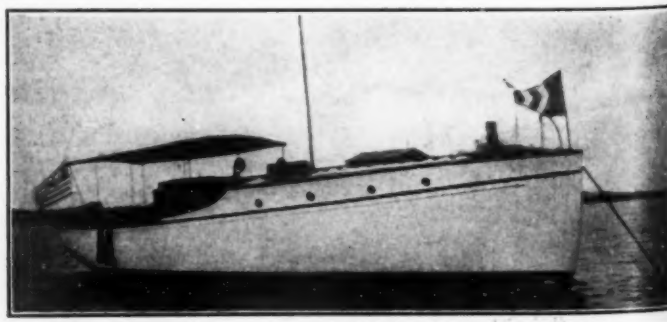
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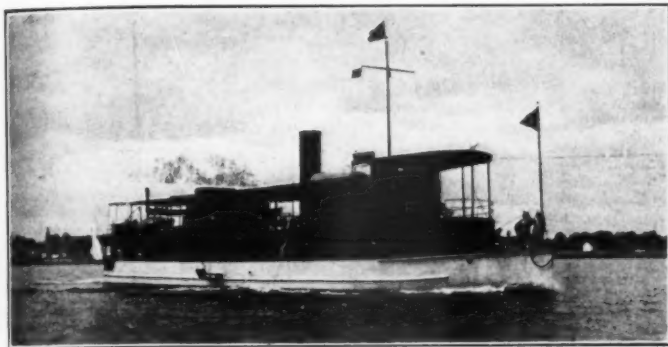
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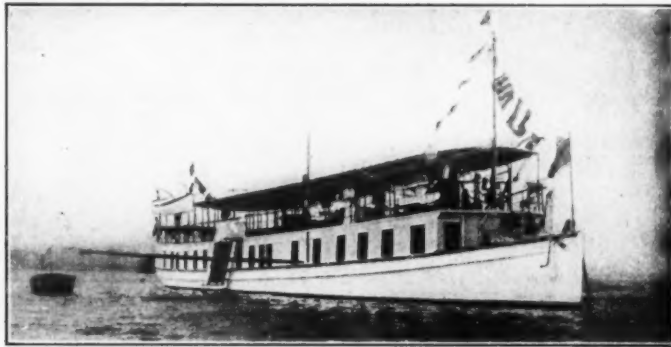
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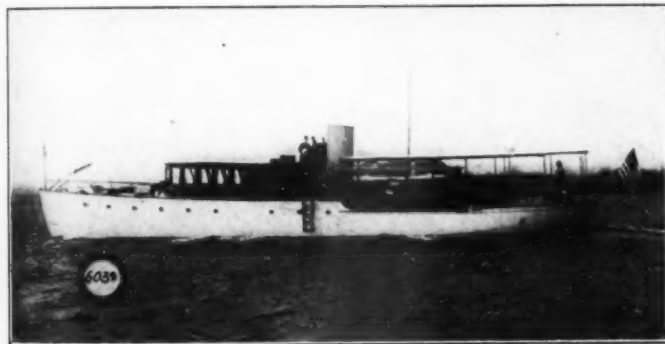
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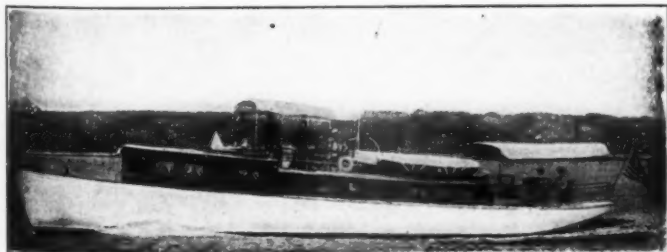
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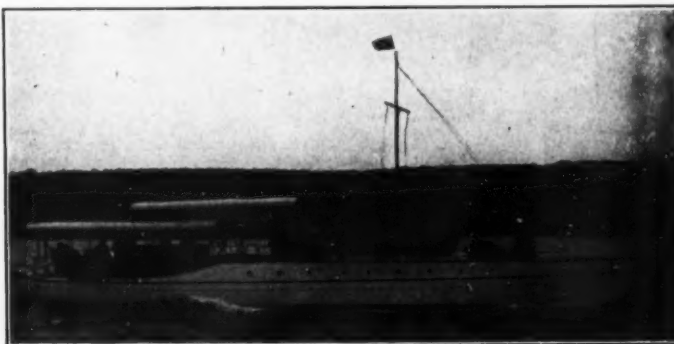
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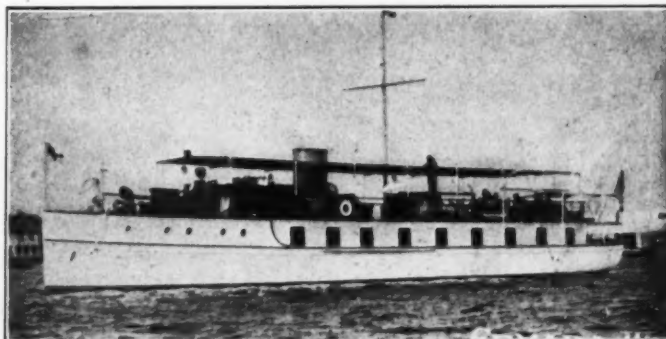
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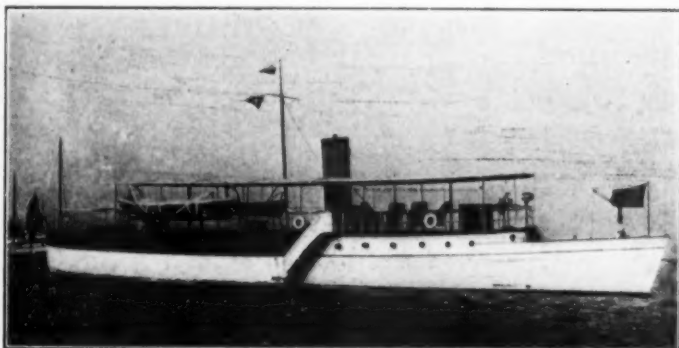
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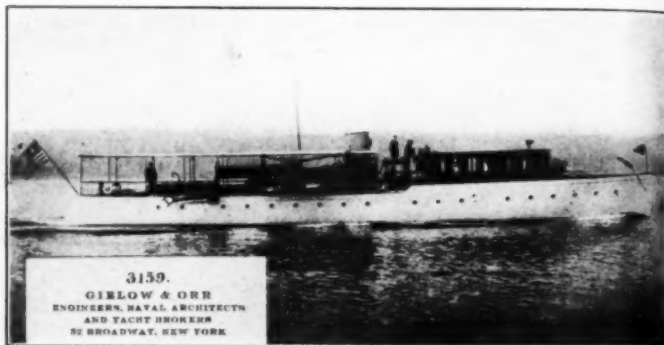
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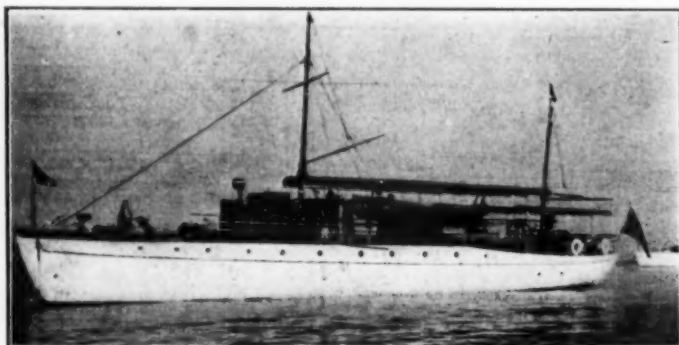
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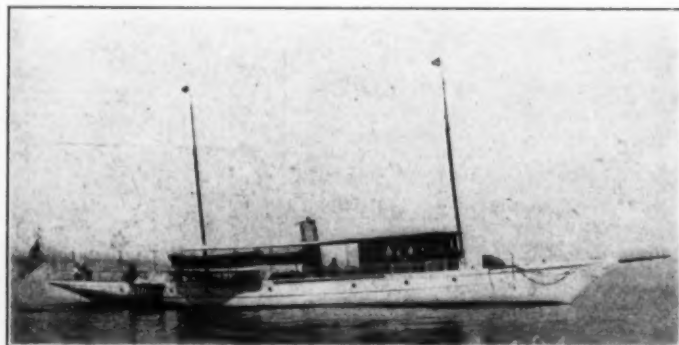
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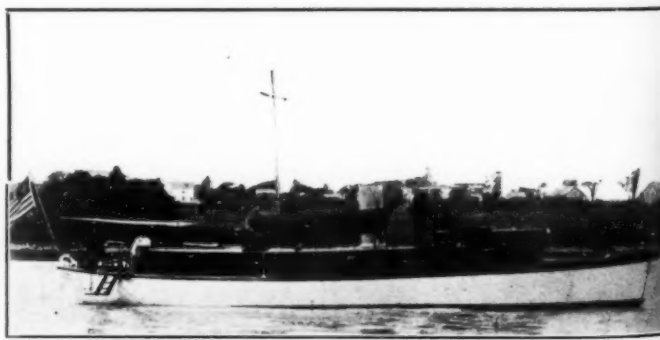
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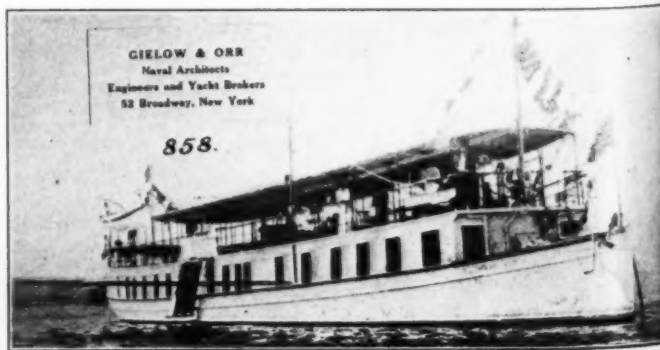
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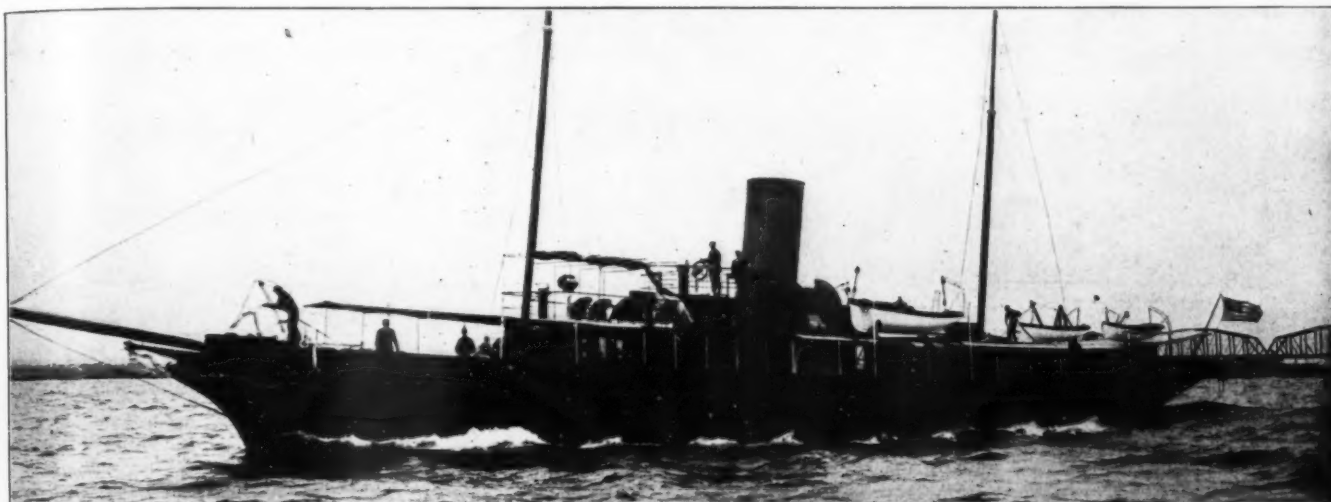
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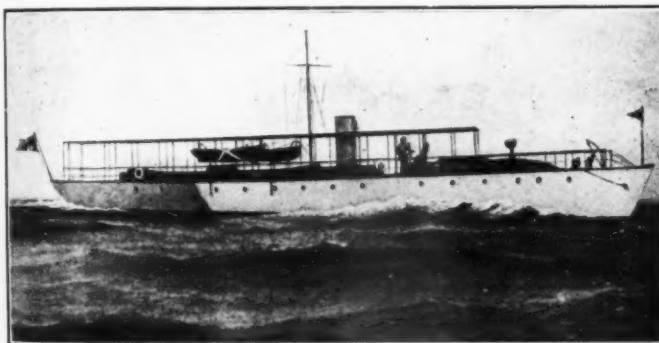
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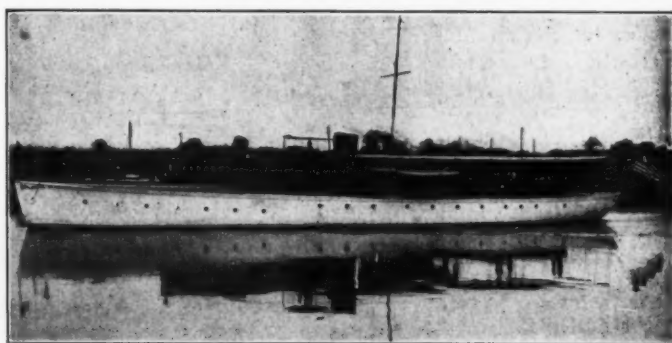
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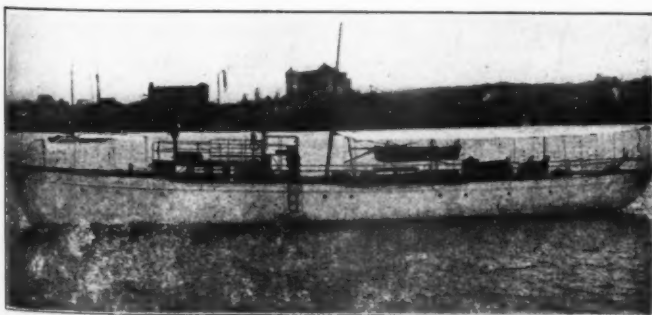
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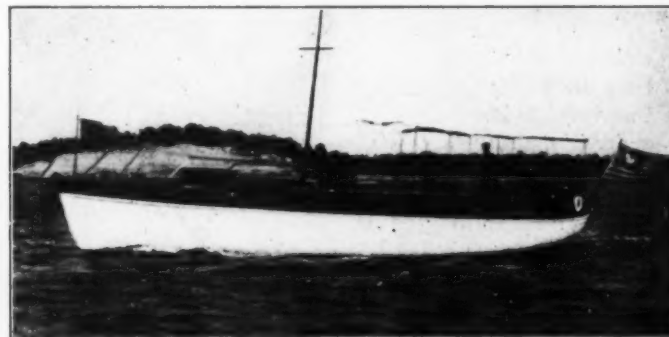
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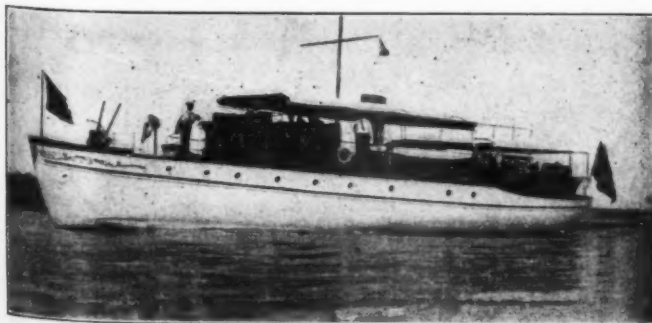
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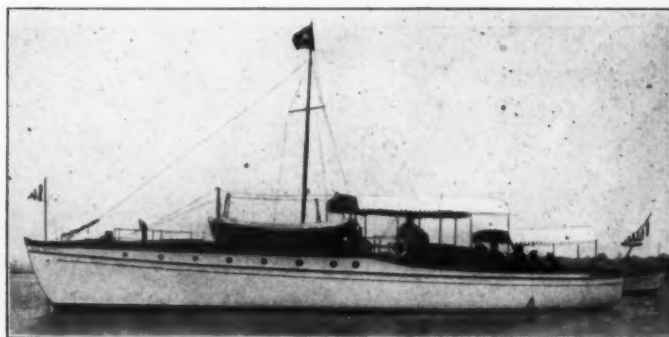
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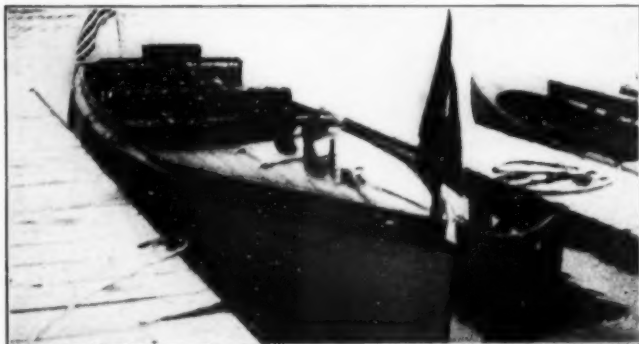
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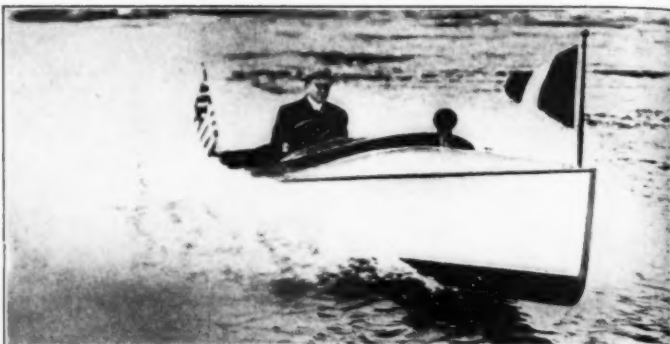
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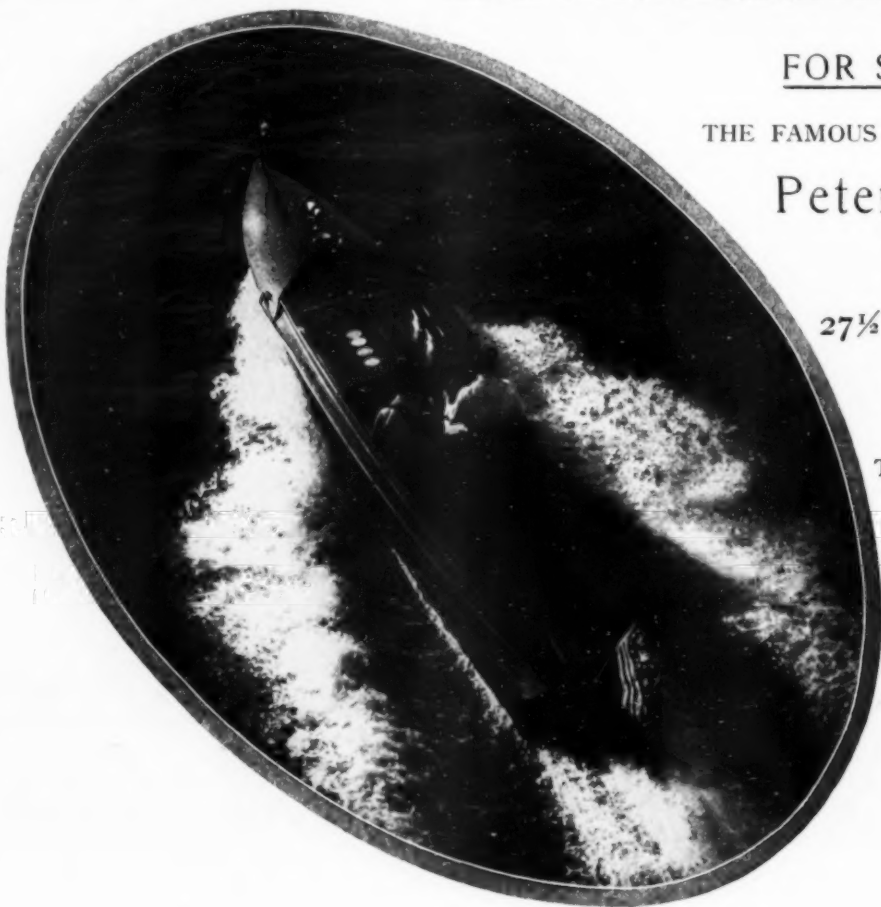
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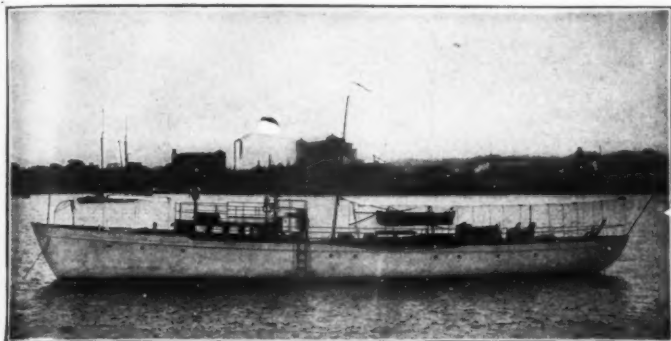
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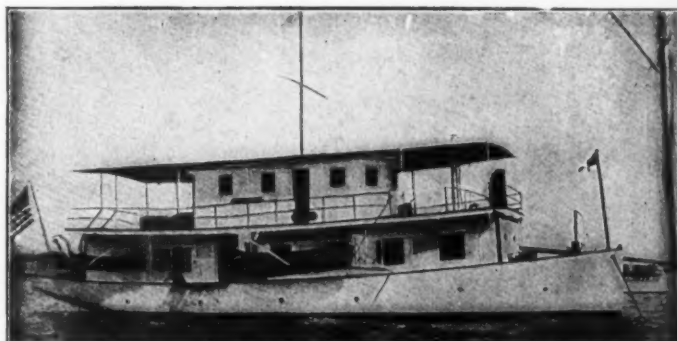
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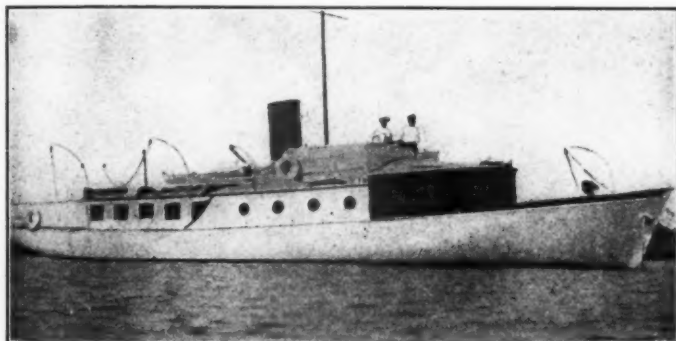
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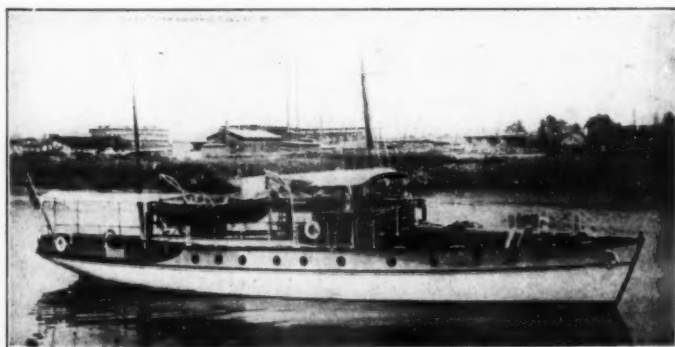
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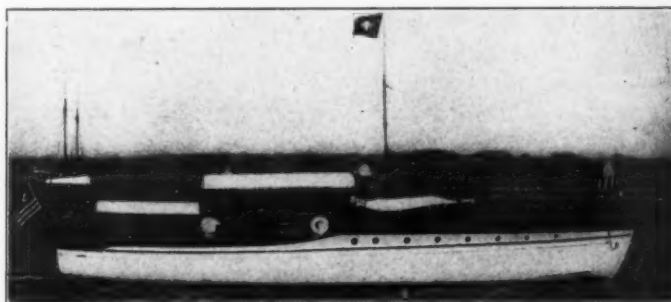
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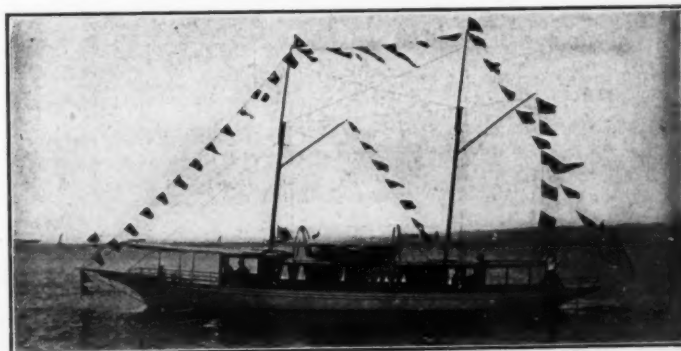
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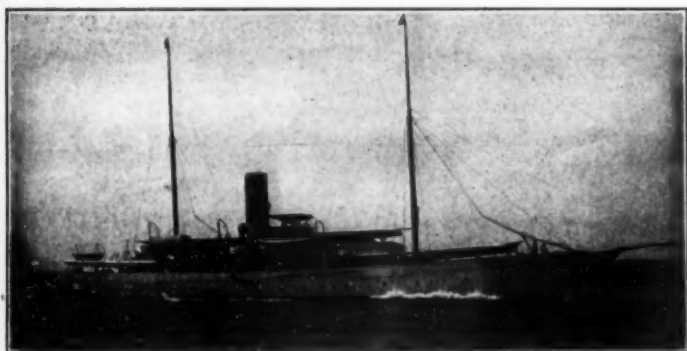
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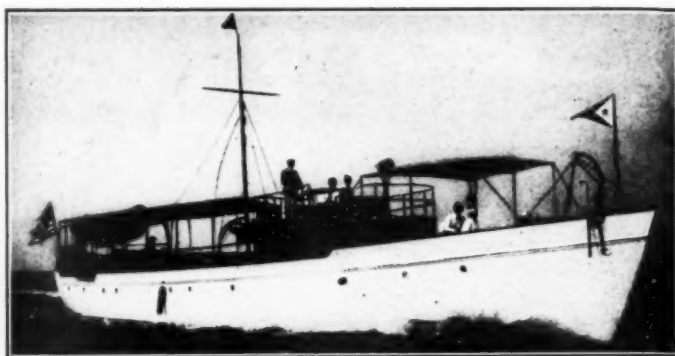
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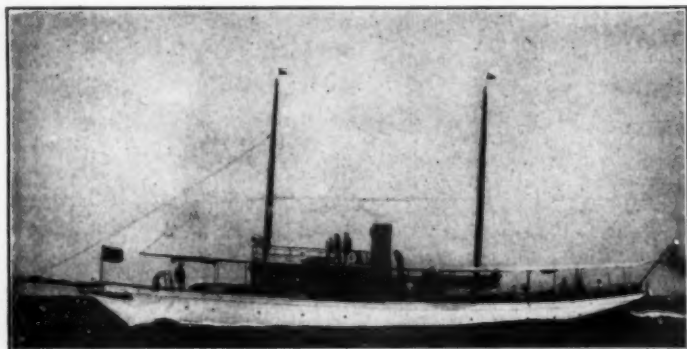
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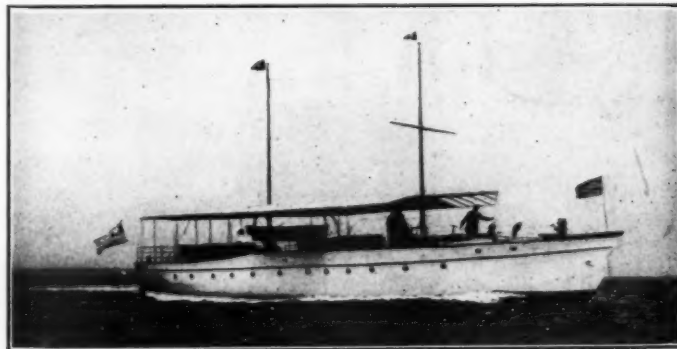
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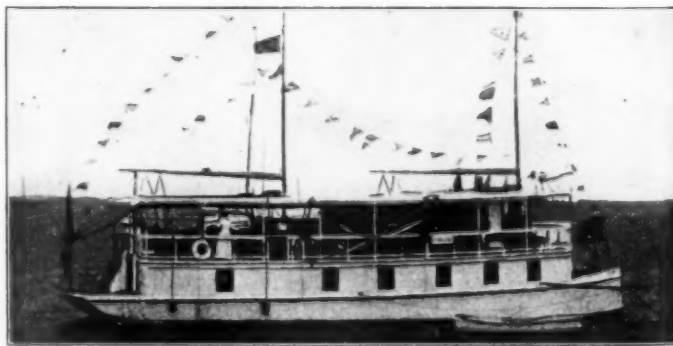
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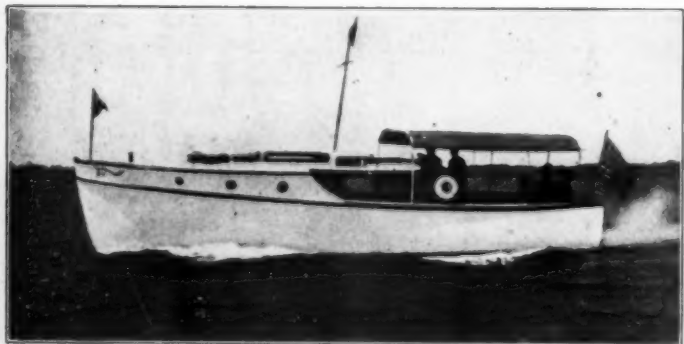
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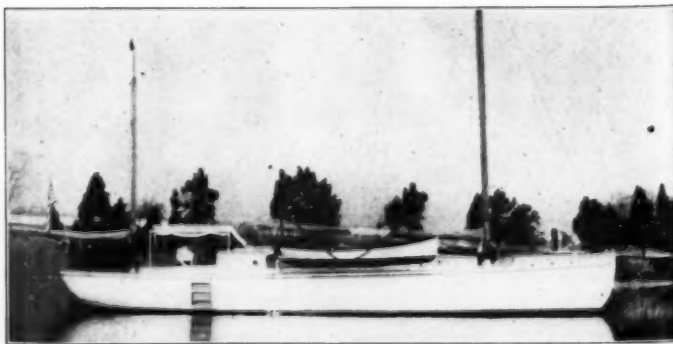
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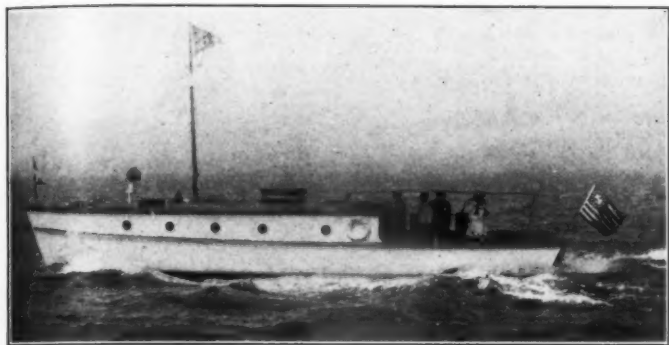
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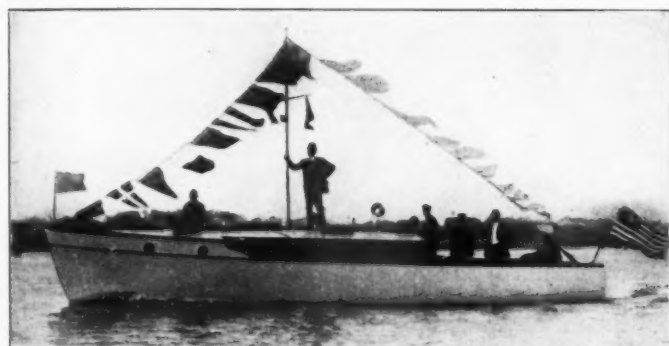
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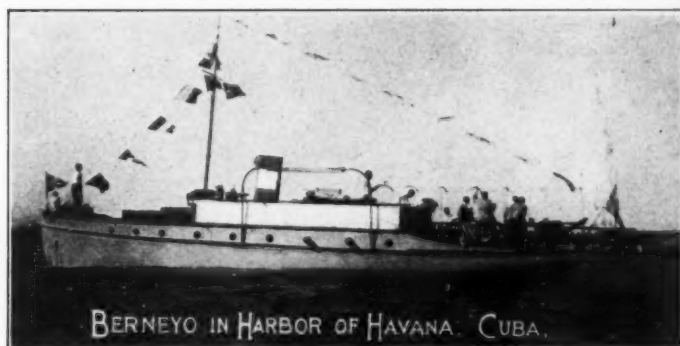
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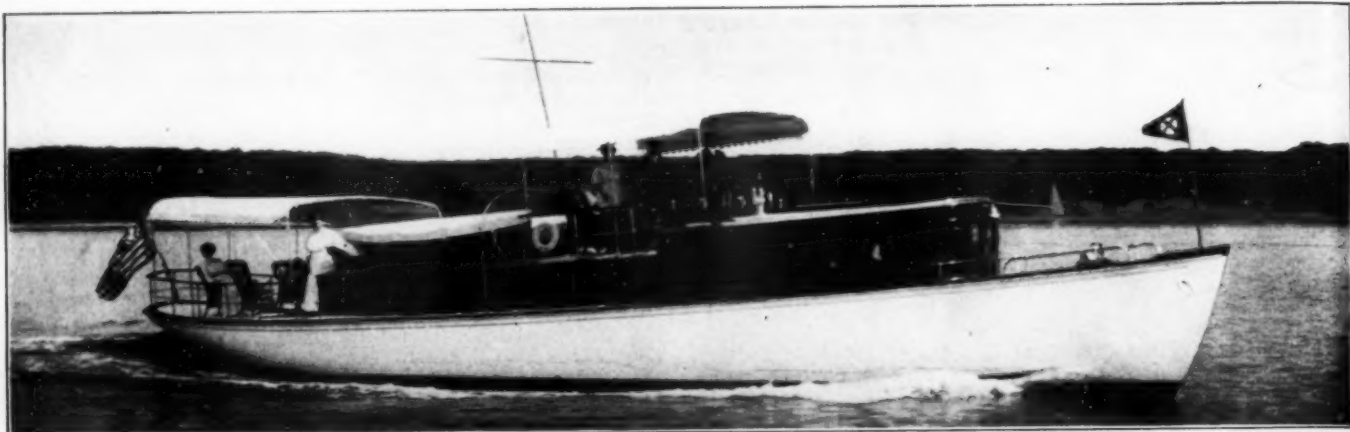
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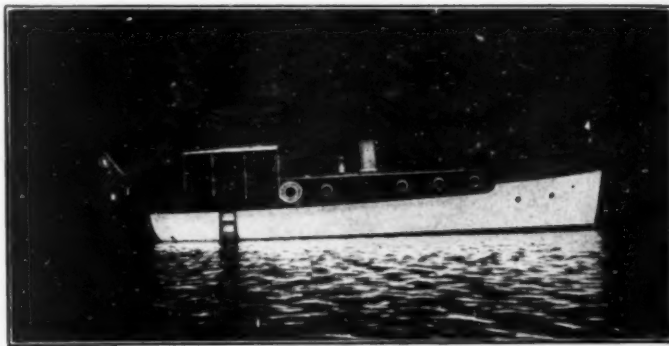
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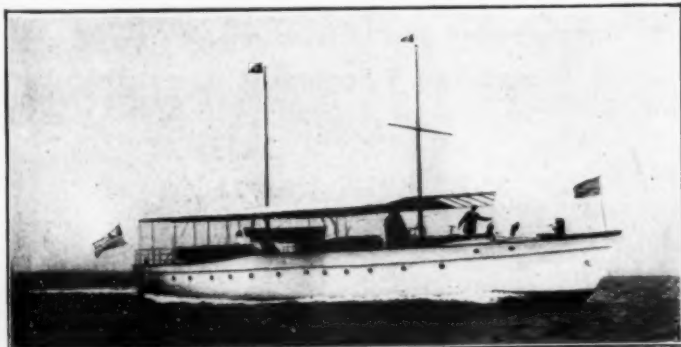
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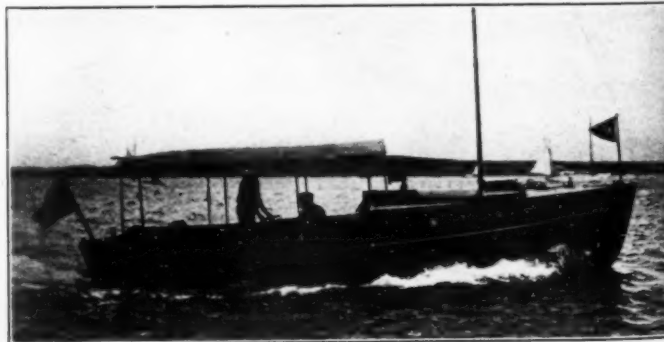
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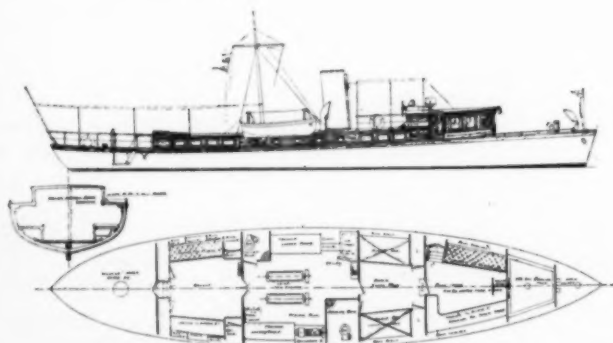
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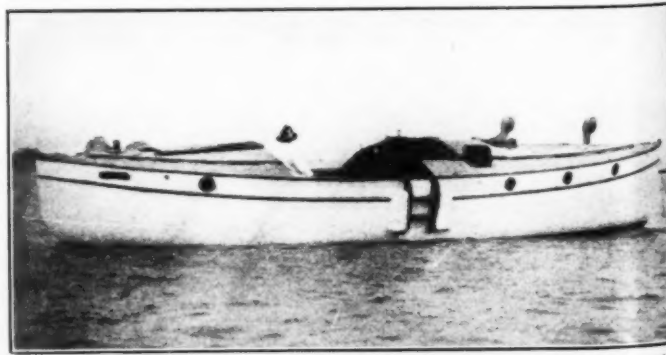
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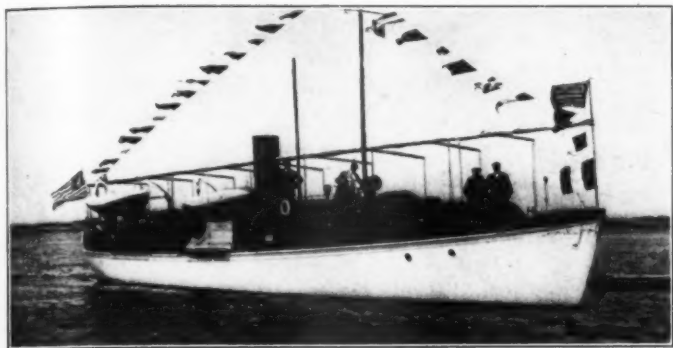
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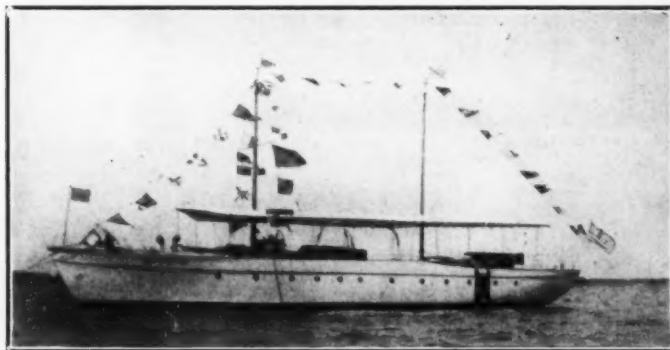
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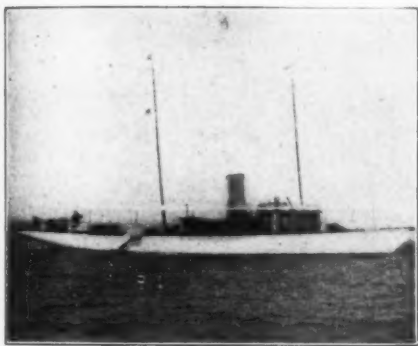
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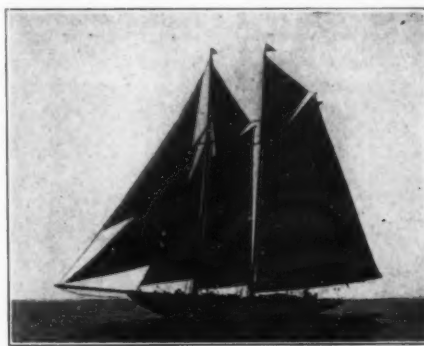


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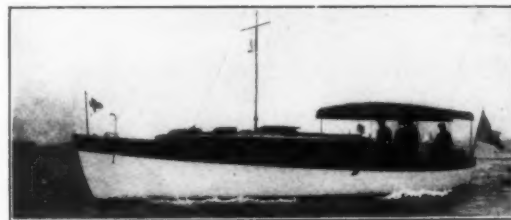
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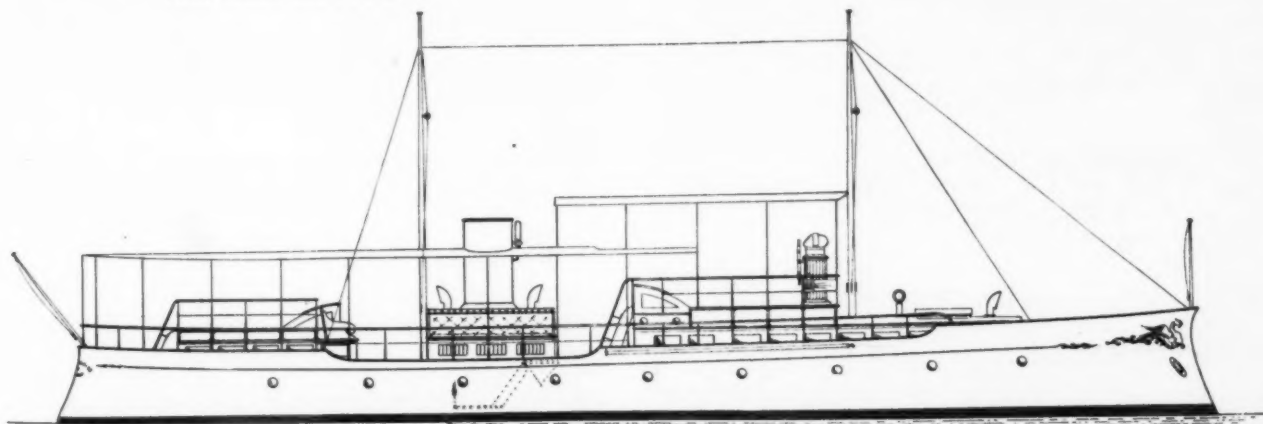
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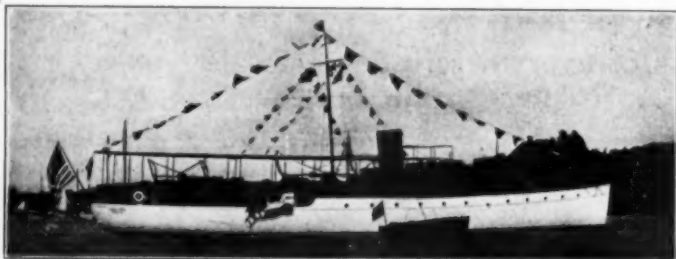
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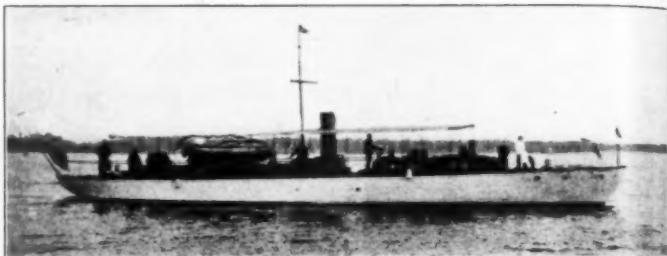
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No. 553—Twin screw, Lawley built, steel, 110 ft.; Standard engines, 4 staterooms, saloon, deck house, baths; luxurious.



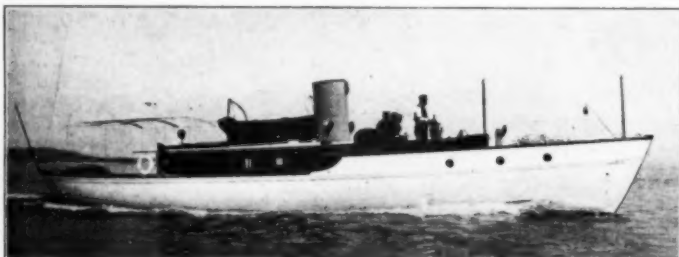
No. 556—Fast express type, 91 ft.; Craig engine. For sale or charter.



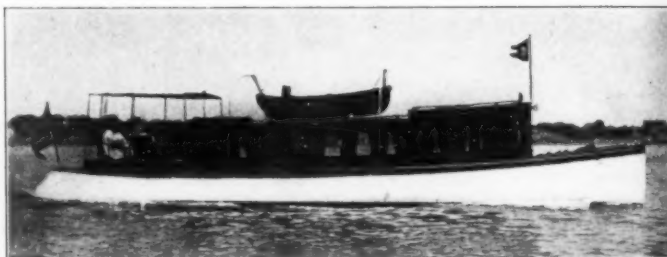
No. 1150—Steam yacht, 117 ft. o. a., 17 ft. beam; built 1903; new boiler, 1908. Sacrifice, offer solicited.



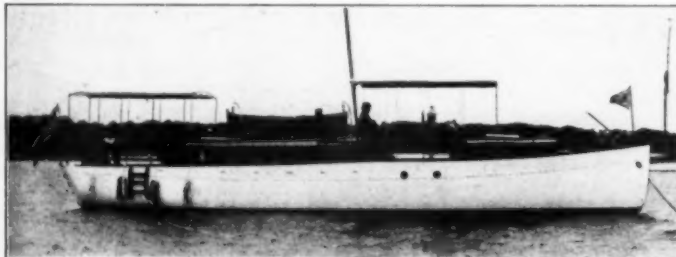
No. 1311—Lawley built steam yacht, 75 ft., suitable commercial service. Sold settle estate. Want offer.



No. 1543—57 ft. gasolene. Designed by Swasey, Raymond & Page. 6 cyl. Standard engine.



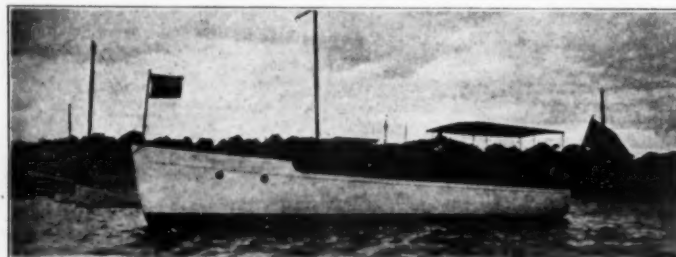
No. 753—Glass cabin cruiser, heavy construction, Murray & Tregurtha engine. Will be sold at a great sacrifice.



No. 1303—Cruiser, 51 ft., excellent for offshore cruising.



No. 1507—Cruiser, 40 ft., raised deck, with bridge control; B. T. 20 H. P. engine. A great bargain.



No. 1441—Raised deck. Large cabin. 20 H. P. Palaco.



No. 1510—Gasolene cruiser, 38 ft., large after deck. Price low.



No. 1136—Fast day cruiser, 36 ft., 16 miles.



No. 1189—Speedy cruiser, with excellent accommodations; Sterling engine, 30-45 H. P., speed 14 miles. Price low for cash.

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TELEPHONE

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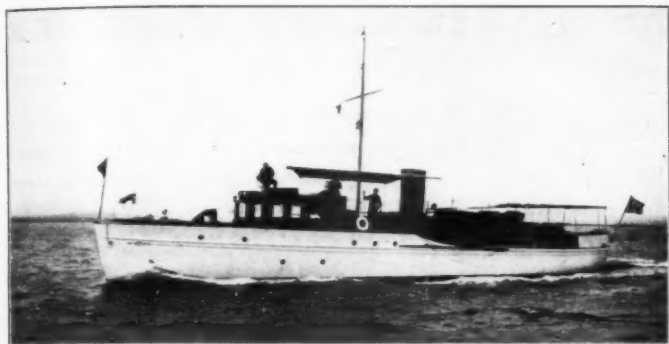
# ELCO

(The Electric Launch Co.)

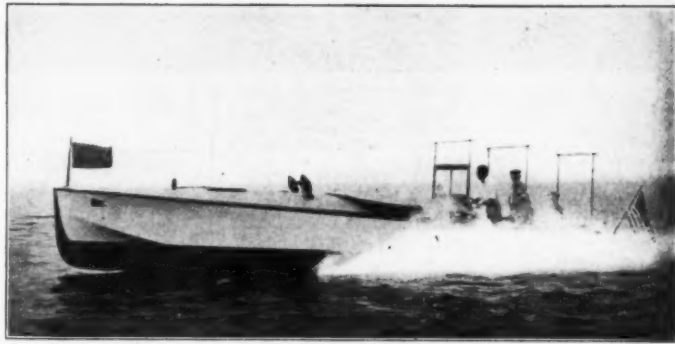
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27 Minutes from Liberty  
and 23rd St. Ferries,  
C. R. R. of N. J.  
to W. 8th St.

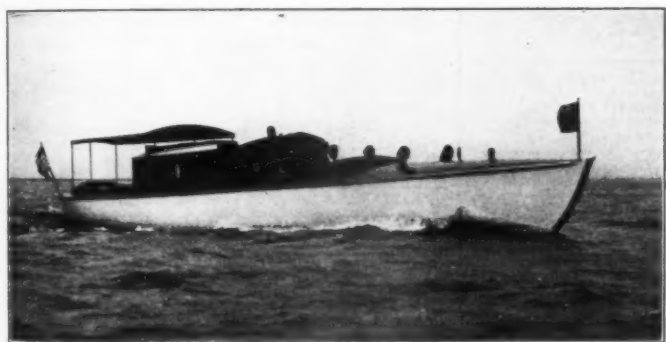
These boats can all be seen at our works, and the purchase made directly from us



No. 1.—84 ft. ELCO MOTOR YACHT. Finished late in season 1911. 125 H.P. Standard engine. Speed 14 miles. A-1 condition.



No. 2.—33 ft. Fauber Hydroplane. Twin screw. Speed, 30 miles. Please mention MOTOR BOATING.



No. 3.—54 ft. ELCO DE-LUXE. Self-starting Standard engine. Overhauled and in perfect condition. Speed 16 miles.



No. 4.—40 ft. ELCO CRUISER. Built 1910. Sleeps seven. Standard engine. Please mention MOTOR BOATING.



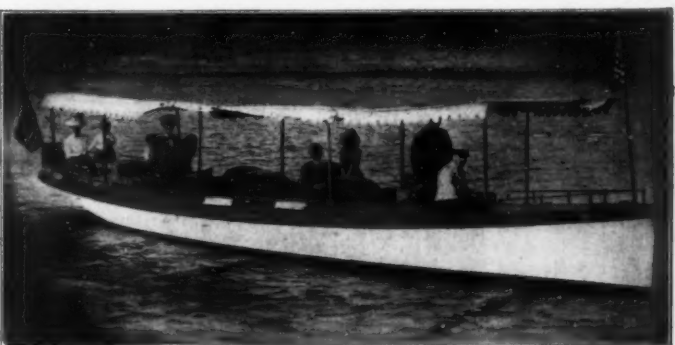
No. 5.—35 ft. ELCO EXPRESS. Six cylinder ELCO engine. Speed 24 miles. Thoroughly overhauled.



No. 6.—28 ft. ELCO EXPRESS. Four cylinder ELCO engine. Speed 20 miles. Please mention MOTOR BOATING.



No. 7.—55 ft. ELECTRIC CABIN LAUNCH. Please mention MOTOR BOATING.



No. 8.—30 ft. ELECTRIC LAUNCH. Perfect condition. Please mention MOTOR BOATING.

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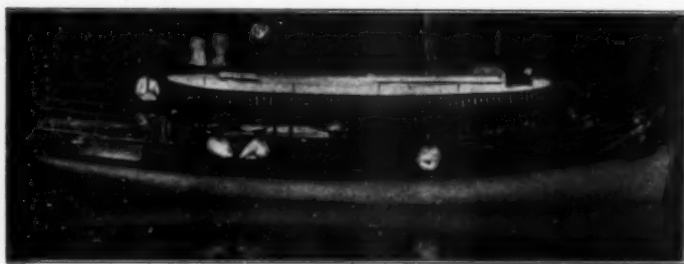


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 Cut one inch deep, one column wide..... \$3  
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Before you buy or before you sell examine the exceptional buying and selling opportunities under this heading. They comprise the best offers of the month. Please mention Motor Boating.



For Sale—Launch, 35 feet over all, 9 feet beam and 2 feet 6 inches draft; 20 horse power Ralaco engine, giving speed of 10 miles an hour. This is a northern built launch planked with white cedar; is in A-1 shape; fully equipped with Sands' toilet, dining table, chairs, cushions, anchors, lights, etc. Price \$850. Address F. M. Terrill, 79 Fairview Ave., Daytona, Fla.

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Any size designed and built.

Before you place the contract for either designing or building your new boat this season, get into communication with us. We can save you money and give you a degree of personal satisfaction in your boat seldom attained by ordinary builders.

Our facilities are complete—our work unexcelled. We are competent to design any kind of a boat you want and make your boat suit your particular requirements exactly. Any make of engine installed. You will have only one profit to pay and one contract to oversee. This will save you both time and money.

We built Patricia and many other well known boats.

Write us your requirements at once. Our brokerage department lists the best boats of all types on the market.

### THE W. F. RUDDOCK BOAT AND YACHT WORKS,

213th and 214th Sts., Harlem River,  
New York City.

Tel., 2219 Audubon. Naval Architects, Marine Engineers, Yacht Brokers, Builders.

CANADIANS, Second-hand engine bargains. Send for list. Guarantee Motor Company, Hamilton, Ont., Canada.

WANTED—Will pay one thousand dollars cash for 35 to 45 foot flush deck, glass cabin cruiser in prime condition. Box 556, Kenilworth, Illinois.

A BARGAIN: Two 4 cylinder, 2 cycle, 50 H.P. Gasoline Engines, complete from Propeller to Fly Wheel, in excellent condition. Fitted with Bosch Magneto, La Vigne Oilers, Heintz Coils, Reverse Gears, etc. Set up ready for inspection. Owner purchased larger engine. Will sell one or both. Price \$375.00 each, F. O. B. Detroit, Mich. Apply C. W. Kotcher, 639 Grafton Ave., Detroit, Mich.

SCORED cylinders repaired, \$8 per bore (up to 6 in.), including grinding to make them smooth and round as before scoring. Send piston with cylinders. Better than re-boring because requires no special oversize pistons and rings. References and further facts on request. Waterbury Welding Company, Waterbury, Conn.

JUMP SPARK COILS 80 cents each. Two Feed Oilers 90 cents each, Four Feed Oilers \$1.20 each, Six Feed Oilers \$1.50 each. We have just come into possession of a job lot of coils and oilers—some have been used—some are new. We have tested them all, the defective ones were sold for junk; those that worked right are worth more. Sold singly or in lots. Act quick. Send money with your order. KRICE CARBURETOR CO., 2 Charlotte Ave., Detroit, Mich.

ONE 4 cylinder, 55 H. P. Vim marine engine, high speed; A-1 condition. Write for description. G. D. Thorndike Machine Co., Portland Pier, Portland, Me.

**HALL ENGINES** First to Havana, First to Key West, First to Atlantic City, the tropics, under all conditions of climate and elements. Winning Four (4) Cups Out of Five (5). Also Winner of Greatest Race of 1898 from Bermuda to New York. No Handicap. Best for boat. Winner of the National Championship and Challenge Race of New York in 1898. Winner of every race entered in cruiser class in United States in 1898. A record which has never been equaled. Holds world's record for hours run and revolutions turned with full load on engine.

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 Southern Representative, Capt. E. J. WINTER,  
 24 East State Street, AGENTS WANTED Savannah, Ga.  
 NEW YORK OFFICE, 50 Church St., Hudson Terminal

ONE 30 ft. speed hull in A-1 condition; at a great sacrifice. A. E. Charlton, Portland Pier, Portland, Me.

BROKEN cylinders and other automobile parts of cast iron and aluminum made good as new by autogenous welding at about one-fourth cost of new ones. Shipment made within 24 hours from arrival. Guarantee, references and indisputable evidence for the asking. Waterbury Welding Works, Waterbury, Conn.

REBUILT 30 H.P. Buffalo engine, four cylinder, four cycle, 6 in. bore x 7 in. stroke, weight 1,600 lbs., 450 r.p.m., medium duty type, jump spark ignition, multiple feed gravity oiler, carburetor, reverse gear, new elevated timer and spark plugs, new 4 cylinder dash coil, plunger circulating pump, flange coupling and ratchet starter. New wire, batteries and switch. Engine thoroughly overhauled and guaranteed to be in first class running order. Cost \$1,500 new, but taken in the way of trade at a low figure and we offer it at a corresponding bargain, crated f. o. b. cars at Boston. Net cash, \$375.00. GRAY-ALDRICH CO., Inc., 33 Commercial Wharf, Boston, Mass.

I HAVE one 6 H. P. Perfection Motor that is practically new. Will sell cheap if taken at once. Never been installed in boat. Only used a couple of times for experimental purposes. L. MACKIBBIN, 326 Lincoln Ave., Detroit, Mich.

### Properties For Sale

A SNAP—Splendid manufacturing plant in good running order, equipped to turn out Motor Boats, Engines, etc., located on Waterfront with excellent shipping facilities. Apply E. F. R. Zoellner, Industrial Broker, 703 Temple Bldg., Toronto, Ont.

FOR SALE at reasonable price, one 300 H. P. six cylinder single acting reversible Standard engine. Has been in use one year and better than new. Reason for sale, am manufacturer of marine motors and am changing Standard for my own make. Also have one Standard lighting outfit in A-1 shape. Will sell both together or separately as purchaser may require. W. E. SCRIPPS, SCRIPPS MOTOR CO., 631 Lincoln Ave., Detroit, Mich.

FOR SALE—One 36-ft. speed boat, 25 miles; one 40-ft. boat, would make good boat for ferry. Write for list of new and used boats. Savanna Boat Works, Savanna, Ill., Box 74.

WANTED, for about \$400, motor launch about 30 x 8 x 2 1/2; about 10 H. P. engine. Give particulars and where can be seen. F. W. Boehmcke, 300 Greenwich Street, New York City.

BARGAINS in Palmer motors, factory rebuilt and guaranteed. E. E. Palmer, 31 East 21st St., City.

NOW AT PALM BEACH, FLA.—AN UNUSUAL BARGAIN. BRIDGE DECK GASOLINE CRUISER; 53 x 10.6 x 3 FT. READY FOR IMMEDIATE USE; FULLY EQUIPPED. COMPLETED LAST JANUARY. SPLENDID CRUISER; MADE TRIP NEW ORLEANS TO PALM BEACH IN 104 HOURS. LARGE SALOON WITH THREE DOUBLE BERTHS, BATHROOM (HOT AND COLD WATER), ELECTRIC LIGHTS, ETC. SPEED 12 MILES; 55 H. P. HEAVY DUTY MOTOR. MAHOGANY CABIN TRUNK, 1 1/4 IN. BEST SEABOAT OF HER SIZE IN FLORIDA WATERS. RARE BARGAIN FOR QUICK BUYER; COST TO DUPLICATE WOULD BE DOUBLE THE SELLING PRICE. THOROUGH TRIAL WILL BE GIVEN. FOR INSPECTION, FURTHER PARTICULARS, ETC., APPLY TO COX & STEVENS, 15 WILLIAM ST., NEW YORK. TELEPHONE 1375 BROAD.

USE "SNAPPER" ENGINES for your small boats. They are a big little engine, built by The Automatic Machine Co., Bridgeport, Conn.

FOR SALE—Gasoline Cruiser, 45 ft. x 9 ft. 6 ins. x 3 ft. 8 ins. Saloon, 8 ft. x 14 ft. Sleeps 4. Toilet; cooking stove; ice chest. Complete outfit for cruising. 30 H.P., 4 cylinder, 4 cycle, high grade engine; 10 light Electric Plant. 12 miles per hour. Slanting awnings. Signal mast. 1 year old. Very strong. ASHLEY HALSEY, P. O. Box 663, Charleston, S. C.

20 to 24 H. P., 4 cyl., 4 cyc., Columbus marine engine, complete equipment, Schebler carburetor, Perfex ignition, Hilton starter, etc. A-1 condition. Reason for selling, installing more power. \$250 net. Reverse gear and knuckle joint, \$25 extra. Write Box 22, Haddon Hall, Prospect Ave., Cleveland, O.

FOR SALE—60 H. P. Thomas engine, 650 pounds, \$235; 45 H. P. Rutenber motor, \$205; 35 H. P. Pope engine, \$185; 20 H. P. Thomas motor, \$125; 4 cylinder 1 cycle, light-weight, high-speed motors. Complete. Guaranteed good as new. Wm. E. Ferguson, 210 Jefferson St., Waterloo, Iowa.

NEW 54 H. P., six-cylinder Elbridge engine, just from factory. Aluminum manifolds, base and cylinder heads, extra finish throughout. Built for Mr. Coleman du Pont of Wilmington, Del.; exchanged for a larger power. Price \$700. Emerson Engine Co., Alexandria, Va.

FOR SALE—A well-advertised marine engine business with small stock of engines, tools, jigs and patterns. Everything up to date and ready to go ahead with Spring work. Automobile lines of manufacture have crowded out the marine engine end of our business. This could be handled by any machine shop; no special machinery needed. For information and price write E. B. T., 248 Canfield W., Detroit, Mich.

FOR SALE—4 cyl. 2 cycle Emerson engine, 40 H. P., complete with 2 Schebler carburetors, Atwater-Kent ignition, Paragon reverse gear. Only slightly used, in perfect condition, light and powerful outfit. Write for price. J. A. Burnham, 70 Kilby Street, Boston, Mass.

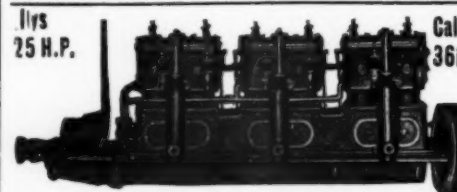
WANT TO BUY the best second-hand raised deck cruiser I can get for not over \$500.00 in the water, Chicago or vicinity; hull must be sound and engine in prime condition; give full particulars. Address R. E. No. 10, care Motor Boating.

FOR SALE—20 x 4 1/2 ft. motor boat hull, new 1911, ready to set engine in, engine bed, gas tank, shaft, stuffing box, all complete, can be bought right. W. H. Van Buren, Castleton, N. Y.

WANTED: Heavy duty gasoline motor, 4 cycle, to suit 50 foot hull. State price and particulars. H. W. Barraclough, 3229 North Front Street, Philadelphia, Pa.

HOW TO RUN AND INSTALL GASOLINE ENGINES, a comprehensive little booklet; sent on receipt of 17 cents in stamps. The Noank Boat Company, Noank, Conn.

THIRTY-TWO ft. cabin cruiser, 20 H.P., 4 cyl. 4 cyc. Continental, one man control, full equipment for cruising, will sacrifice for cash. H. C. Barnes, 1520 Columbus Road, Cleveland, Ohio.



115  
25 H.P.

Calliph  
36 H.P.

6 TO 6 CYLINDERS

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It will sell the boats, engines or accessories you have laid aside—turn them into cash. There is a customer somewhere for every usable article in existence. This department will introduce you to that customer, or several of them. Try it. See rates above. Mail your order before the fifteenth for the following month's issue. Send remittance and full information and we will write your advertisement.

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MARINE MOTORS OF ALL TYPES

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Naval Architect, Engineer and Broker

Steel, wood and composite yachts and commercial vessels  
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Plans, Specifications and Estimates furnished for all requirements.  
Descriptions and Photos submitted upon receipt of inquiry.

## Yard and Shop.

(Continued from page 58.)

book as useful and instructive as possible to the layman and those without technical knowledge, actual photographs have been used for illustrations instead of mechanical or working drawings. Although written in simple language, free from technical terms, it is thorough and complete enough to be an invaluable handbook for the experienced boatman and boat builder. Owners of motor boats, no matter what make of engine they have, can learn a lot from the Ferro treatise, as the book contains a great deal of information regarding the correct design, construction, installation and operation of marine engines and equipment, which is as true for one make of engine as another. Every person who is interested in motor boating in any way, shape or manner will find this a most useful book to own. Although it is a really valuable work which could readily be sold at 25 or 50 cents and well worth the price, the Ferro Machine and Foundry Company advise that for a limited time at least, they will send a copy free to any reader of *MOTOR BOATING* upon application to the main offices, 36 Hubbard Avenue, Cleveland, O.

### Gray Motor Company Drop Accessory Business.

Owing to the large increase in their marine engine business during the past year, the Gray Motor Company, of Detroit, Mich., have decided to give up their business of handling a line of accessories in order to devote their entire attention to the output of marine engines. During the rush season in the spring and early summer, it was found that the business of handling accessories, especially in the shipping department, interfered with keeping right up to the schedule on the marine engine side and so it was found necessary to either organize an entirely new and separate department for the accessory business or discontinue it entirely. The company took the latter step by selling the accessory end to the Emmons Specialty Company of Detroit, Mich. Mr. E. M. Emmons, who will manage the new company, has been with the Gray people for a number of years and before that time had entire charge of the accessory departments of several other large marine engine houses. He is, therefore, well qualified to take over this branch of the business and handle it in a manner that will be satisfactory to all concerned.

### E. M. Sherman Now on the Pacific Coast.

Eugene M. Sherman, who makes marine compasses in various styles and brass and mahogany binnacles, has taken his business from Lexington, Mass., all the way across the continent to Seattle, Wash., and will henceforth handle his eastern trade through agencies. He has a liberal proposition for representative dealers in unoccupied territory. Mr. Sherman's new address is Bellevue P. O., Seattle, Wash.

### Anderson Engine Company Establishes Chicago Office.

In order to get into closer touch with their trade and for the greater convenience of customers, the Anderson Engine Company, of Shelbyville, Ill., has established an office at 160 North Fifth Avenue, northwest corner Randolph Street, Chicago, Ill., where all future correspondence will be taken care of and a few sample engines carried. All shipments will be made as heretofore from the Shelbyville factory.

### The Palmer Brothers Line for 1912.

Palmer Brothers, of Cos Cob, Conn., have announced their line of motor motors for the coming season, which includes a 3½ and 6 h.p., two-port, reversible engine, a 2, 3½ and 5½ h.p., three-port, and a 4, 8 and 11 h.p., three-port motor, all with make-and-break ignition, and operating on the two-cycle principle. The two-cycle, three-port, jump-spark line is built in single-cylinder, 2½, 4 and 6 h.p. sizes, two-cylinder, 5, 8, 10 and 12 h.p. sizes, and in 8, 15 and 18 h.p., three-cylinder models. The Model R, four-cycle motor, run in 5, 10, 15, 18 and 20 h.p. sizes, in 1, 2, 3 and 4 cylinders and the Model L, four-cycle engines are rated at 3½, 8 and 14 h.p., and are built with 1, 2 and 4 cylinders. Besides these motors, there is the type K, heavy-duty, built with 2, 3 and 4 cylinders and rated at 20 to 25, 30 to 35 and 45 to 50 h.p. respectively. These engines are known as the "oysterman's motors," large numbers of them being in oyster boats, both driving the boat and operating the dredge hoist. All Palmer motors are equipped with float feed carburetors. Parson's white bronze bearings are used on crankshaft and connecting rod. Connecting rods are 40 per cent.

(Continued on page 76.)

## NAVAL ARCHITECTS & YACHT BROKERS

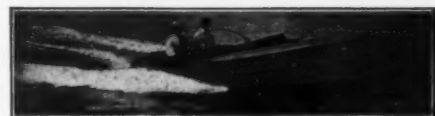


Photo II—The most successful 21 footer—Speed, Seaworthiness, Comfort and Simplicity. Amateurs can build my original "V" bottom boats. Send stamp for illustrated circular of design.

WILLIAM H. HAND, JR., Naval Architect, New Bedford, Mass.

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Simple for an amateur to build. Knock down or complete boats as desired  
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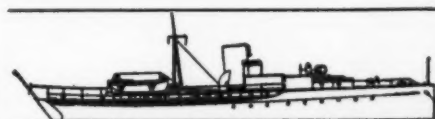
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Both marine and stationary, gas, gasoline, distillate, alcohol and fuel oil. 20 to 200 H. P. Economical and easy to start.

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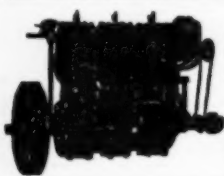
Only the "power for weight" offered by Elbridge "Featherweight" Engines will enable you to get best results from your light tender, V-bottom, or speed hull. Our catalog will interest you. It's free.

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1, 2 and 3 Cylinders, 3 to 30 H.P.  
Two port system with  
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The HALL OPPOSED can be run on the governor or handled by throttle without changing adjustment. No vibration, smooth, steady running, working parts easily accessible but not exposed, absolutely reliable.

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500 Sizes for Open Boats and Cruisers. FREE CATALOG  
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## STANLEY MARINE MOTOR

High in Quality Low in Price

**THE STANLEY CO.**

SALEM, MASS.  
Send for Catalog

## Yard and Shop.

(Continued from page 75.)

carbon steel, drop-forged and fitted with Parson's bushings at the large end. The piston is cast with a deflector attached and fitted with three rings which are made from a special grade of cast iron and cut with a lap joint.

### Fox Motors Simplified this Year.

The Fox line of marine motors, made by the Dean Manufacturing Co., of Newport, Ky., are being made in an even more simplified design for 1912 than in previous years. The line comprises 20 stock sizes made in four different types so as to meet every possible requirement of motor boat owners. The Fox Special motors are for small boats, 14 to 22 feet in length, the medium-duty motors for medium-speed boats, the heavy-duty motors for large hulls and strenuous requirements, and the De Luxe motors, where high speed and endurance together with the lightest weight consistent with strength and durability is wanted. The Special type is simple enough and safe enough for a boy to operate. They are two-cycle, three-port motors, built in a single-cylinder, 3½ h.p. size, and with two cylinders rated at 7 h.p. The heavy-duty line is made in 5 to 7 and 9 to 12 h.p., single-cylinder and 10 to 14 and 18 to 24 h.p., double-cylinder sizes. They are a two-cycle, two-port engine, reversible, with extra long bearings, and are built very simply for hard, constant service. The medium-duty engines are designed for pleasure and semi-speed boats. They are two-cycle and equipped with the Fox Fourth Port Accelerator. These engines are built with 1, 2 and 3 cylinders, and are rated at from 7 to 30 h.p. The De Luxe motors are a fine type of high-speed, light-weight machine. They are built with 4 and 6 cylinders, developing from 24 to 75 h.p., and are equipped with Fourth Port Accelerator and Bosch magneto and have a chrome nickel steel shaft with extremely long bearings. These engines will give splendid service in speed boats, hydroplanes and aeroplanes.

### Belle Isle Motors for 1912.

There are no radical changes in the Belle Isle motors for 1912 beyond a few improvements in the construction, which have nothing to do with the operation of the motor except to make it more convenient. Belle Isle No. 1 is a very popular model. It is extremely low in price, yet no expense is spared to make it one of the most perfect small engines on the market to-day. It is a single cylinder, developing 2 H. P. and an excellent feature is its remarkable compactness, being only 11¼ inches high from center of crank shaft and weighing but 73 pounds. It will drive an ordinary row boat or a 14 to 18-foot launch with a full load from 5 to 8 miles an hour. The price for the bare engine is \$23.00 and with accessories and boat fittings, \$47.00. The No. 2 model is another small engine, which deservedly finds much favor. It is designed exactly after the No. 1, except that it is larger and much more powerful. It is very strong and durable and its workmanship and materials are of the very highest class. The engine measures 14 inches from the center of crank shaft and weighs about 125 pounds. It will develop from 4 to 5 H. P. and will drive an 18-foot launch at a speed of from 6 to 8 miles an hour. The bare engine is sold at \$40.00 and the price is \$69.00 with accessories and boat fittings. For launches 28 to 30 feet in length, the Belle Isle No. 4 is well adapted. It is neat, compact and reliable and has no piping, gears or valves to get out of order and worry the operator. It will make from 6 to 10 miles an hour with the launch loaded to capacity. This engine is sold unequipped at \$107.50 and at \$155.50 with accessories and fittings. All of these models are sold on 30 days' free trial, which insures satisfaction to the purchaser. This popular line of motors is made by the Concrete Form and Engine Company of Detroit, Mich.

### Gear Company Get More Room.

The Kennedy Machine Company, of Detroit, Mich., after their first season, found their initial quarters much too small and have moved into another factory at 226 Abbott Street with three times the former capacity, which will enable them to fill all orders for their "Bull Dog" reversed gears promptly. These gears are designed especially for motor boat work and to meet every emergency which is encountered in the most severe service. The clutch is a multiple disc type permitting the machine to be made much smaller in diameter without

(Continued on page 78.)

## Stop Paying for Marine Engine Experiments

Reputable agents wanted to handle popular-priced marine engine. Absolutely guaranteed for 5 years. Thirty days' trial by the purchaser. Your money promptly refunded, without question, if you are not fully satisfied.

A sure favorite and quick seller. Big returns assured. Simplicity the keynote of construction.

Just the engine you have been looking and waiting for. Combines the good features of the best, with all the bad ones eliminated.

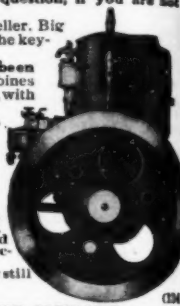
Pool-proof. As near perfect as anything mechanical can be produced.

All sizes in stock from 2 to 50 h. p. Ready to ship on 24 hours' notice if necessary.

Details of the greatest selling plan and agents' money-making proposition ever offered. Liberal discount, specified territory and absolute protection to accepted agents.

Some very productive territory still open.

Write today for Catalog  
**COLUMBIA ENGINE COMPANY**  
3 Mt. Elliott Avenue, DETROIT, MICH.



## "CHUG-CHUG" ALONG IN YOUR ROW BOAT

Put oars aside—no more long, tedious, muscle straining rowing. Just slip onto the rear of your row boat and



## EVINRUDE MOTOR

and be "in the swim" with other motor boats and launches. Not a toy, but a perfectly practical, strong 1½ H. P. engine. Will propel any row boat from 6 to 8 miles an hour. Weighs 50 pounds easily and quickly adjusted and works wonderfully. Doesn't cost much. Everybody at the lakes will have one this summer. Guaranteed satisfactory or money back. Send for illustrated booklet.

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New York Sales Room, 260 West Broadway.

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Send for Catalog now.

We also manufacture COILS and STORAGE BATTERIES of the highest quality.

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## MONARCH CARBURETORS

In addition to the usual features, based on scientific laws of carburetion, have several special features that fit them particularly for marine work.

Easier starting, greater speed and flexibility for either two or four cycle engines of any design.  
Vaporizers, Auxiliary Air Valves, Check Valves, Pump Suction Connections with Strainer, Stuffing Boxes and Stern Bearings. Write for Catalog.

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112 Front St., Brooklyn, N. Y., U. S. A.

## THE THELMA ENGINE

Tremendous power, compact, exclusive, no complications, simple and absolutely dependable.

Recognized by Detroit River motor-boat men as the most efficient motor-boat engine made. Write for descriptive circular.

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270 Junction Ave., DETROIT, MICH.

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Boat Frames and Fittings covered with government khaki duck. The best hoods on the market. Send for prices and catalogue.

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PRICES WAY DOWN BEFORE STOCK-TAKING  
One 18 ft. Toppan Dory, Lapped, 3 H.P. Was \$275 Now \$225  
One 19 ft. Toppan Dory, Smooth Was 300 Now 240  
One 20 ft. Toppan Dory, " Was 425 Now 340  
One 22 ft. Toppan Dory, " Was 600 Now 480  
One 30 ft. Raised Deck, " Was 1750 Now 1400

PRICES REDUCED ON 2 TO 24 H. P. MOTORS  
KNOCKED DOWN FRAMES AND PAPER PATTERNS  
BUY NOW AND SAVE MONEY

**TOPPAN BOAT MANUFACTURING CO.**  
21 Haverhill St., Boston, Mass.

## TROUT WHEEL

Two, Three or Four Blades  
For Speed Boats or General Service.



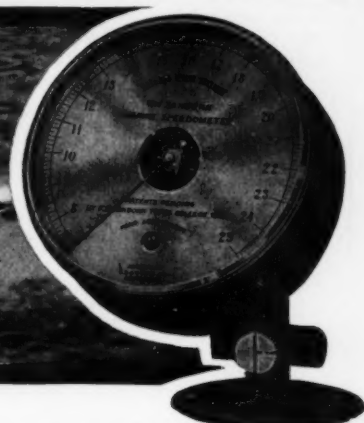
TRADE MARK



Adopted by the Foremost Engine Makers of the Country.

**H. G. TROUT COMPANY, BUFFALO, N. Y.**

# The SANBORN Marine Speedometer



**A Mechanically Perfect Device which enables you to know Your Exact Speed Any Time, Any Weather, Any Water, Daylight or Darkness**

The Sanborn Marine Speedometer is easy to install on any boat and it invariably registers perfectly under every condition. Its absolute accuracy and reliability is always just the same, in any water in which the propeller will revolve.

The Sanborn enables you to make your boat 100% efficient. When you know your exact speed you can experiment and find a dozen ways to get more power and speed out of your boat and its equipment. Adjust your carburetor, alter your ignition a little, try a new propeller, tune up the motor, test a new brand of oil or grease, shift your ballast, etc. etc. The Sanborn will show you the exact effect of every change and eliminate all guesswork. It will help you find your way in darkness and fog, help navigate strange waters intelligently, enable you to govern your speed to accommodate your time allowance, etc. Its uses and advantages are innumerable.

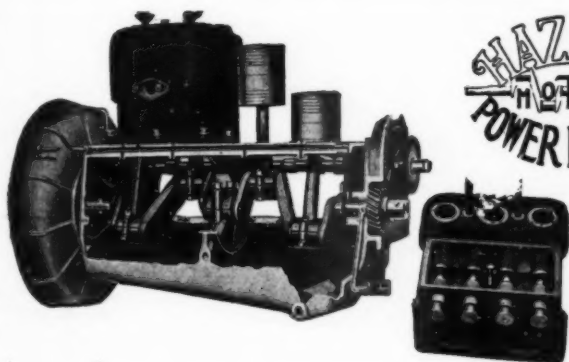
The Sanborn is perfect in mechanism and perfect in operation. The inlet protrudes a short distance below the bottom of the boat and is protected by a shield which prevents the entrance of anything to clog the opening. A cleaning wire is also provided which remains in the inlet tube and is a further protection against any possibility of trouble.

The Sanborn is so installed that it cannot possibly cause the boat to leak. Every condition affecting the operation and continuous service of a Marine Speedometer has been successfully conquered.

Write us today for full information.

**AMERICAN STEAM GAUGE & VALVE MFG. CO.**  
NEW YORK CHICAGO BOSTON ATLANTA

**Boston, Mass.**  
PITTSBURGH



**HAZARD  
MOTOR  
POWER PLANTS**

## One of Many Features of Hazard Unit Power Plants OILING SYSTEM

The Hazard Oiling System is automatic and a combination of force feed and gravity. The base carries approximately two gallons of oil, which is forced by a gear pump, driven by the timer shaft, to a channel through the engine base and is screened delivered by gravity to a pocket over each of the crank shaft bearings, and a stream of oil also flows on the connecting rods as they revolve. This oil lubricates these bearings and throws the excess oil into the cylinders and upon the cams and cam shaft bearings. By this system all bearings are positively oiled, and all dirty outside oiling devices are eliminated. This is not a splash system of oiling, and connecting rods should not dip in the oil. No stuffing gland is used on the pump, which leaves no chance for an oil leak at that point. Motor will properly lubricate until all oil in crank pit is consumed. A settling pocket and drain plug are provided for the removal of carbon deposits. The base of cylinders has a small hole opening from the valve pocket to crank case, which serves the double purpose of returning the oil which works up around the valve tappets to the sump, and also permits a spray to form in valve pocket, which lubricates the valve stems and prevents sticking and wear.

**Other Features:** All parts enclosed (making an oil-tight motor). Fly-wheel enclosed. Valves enclosed. Three-Point Suspension. Entire outfit, a complete unit ready to install and run.

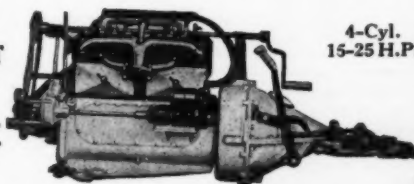
No Time Limit to Our Guarantee

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ROCHESTER, N. Y.**

New York Sales Agent, G. H. Scanlan, 137 Liberty St., New York City; Central States Distributors, James M. Wait & Co., 1205 Michigan Ave., Chicago, Ill.; Canadian Distributors, A. R. Williams Machinery Co., Ltd., Toronto, Ont.

Some Valuable Agencies Open. Write for Particulars



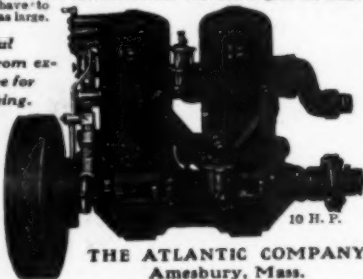
4-Cyl.  
15-25 H.P.



### THE ATLANTIC SPECIAL MOTOR MADE THE "GURNET" DORY FAMOUS

Medium-duty type, heavy enough for the hardest work. Wearing parts as big as the heaviest motors. Material so good the motor doesn't have to be quite as large.

Truthful facts from experience for the asking.



THE ATLANTIC COMPANY  
Amesbury, Mass.  
SALESROOMS: (BOSTON, 93 HAVERHILL STREET  
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Nothing  
External  
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### DETROIT REVERSE GEAR Starts—Reverses—Stops INSTANTANEOUSLY

All working  
parts sub-  
merged in oil  
bath at every  
revolution.

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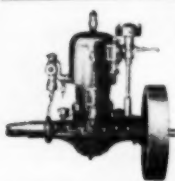
The Simplest, Most Reliable, Most Compact and the Smallest Perfect Marine Reverse Gear ever offered. No outside moving parts to throw the oil or grease, tear the skirts, bruise the hands or catch waste. No noise. Manufactured in sizes for from 2 to 80 H. P. We carry all sizes in stock for immediate shipment. Guaranteed for one year. Write for special prices and free catalog. Valuable information from our Consultation Department FREE to motor boat men.

Detroit Engine Works, 14 Beaufait Ave., Detroit, Mich.

### "V" Bottom Hydroplane—\$110

Hull, 16 ft. x 4 ft. finished, ready for engine and equipment. This little boat is our chief salesman: it sells our higher priced auto express and speed launches. Why? Because it is a sample of our work and shows the remarkable all-around qualities of this type. This price for a limited time only.

THE M. I. DOYLE CO., 50 Church Street, New York



### Capital Motors

1 to 4 CYLINDERS  
Excelled by none. Send for catalog  
We are looking for a live man on a state agency proposition.

FIFIELD BROS. COMPANY  
AUGUSTA - - MAINE

### HUDSON YACHT AND BOAT CO.

### An Ideal Cruiser

Duplicates of Eimo II, winner of Marblehead Race in 1909 and 1910, built to order. Comfortable, seaworthy and easily handled by one person. Stock models of 25, 28, and 31 ft. cruisers built on similar lines; and 20 and 24 ft. semi-speed boats. Estimates cheerfully furnished on all types of power and sail boats.

MILTON BOAT WORKS, RYE, N. Y.



### MORRIS CANVAS MOTOR HULLS

The most serviceable light hull in use. 14 miles per hour, for \$250.00. High grade construction and equipment. Length 20 ft.

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### RICHARDSON

Boats of any kind in any stage of construction, knock down or finished.  
Write for estimate

G.R. RICHARDSON, 250 North Tonawanda, N.Y.

### Yard and Shop.

(Continued from page 76.)

sacrificing holding capacity. All moving parts are enclosed in an oil-tight case, which gives perfect lubrication at all times, prevents sling- ing of oil, protects the working parts against bilge water and prevents the catching of clothing.

On the forward drive, the whole revolving mechanism is locked so that it turns without any wear of the parts or loss of power, also acting as an auxiliary fly wheel. On the reverse motion, the gear cage is held by a bronze clutch band from turning and through the gearing, the propeller is turned in the opposite direction with a net reduction in speed of 20%. "Bull-Dog" gears are made in four models, ranging from \$18.00 to \$80.00 in iron and \$23.00 to \$97.50 in aluminum. A strong recommendation is that of the hundreds of gears supplied in 1911, not a single complaint has been received by the manufacturers.

### Gas Producer Maker Changes Address.

The Kerosene Gas Producer Company, sole agents for the Universal Hydrocarbon Gas Producer, manufactured by the Universal Oil Converter Company of Long Island City, has changed its address to 1926 Broadway, New York City, where all communications in reference to the business of either company should be sent. A number of engines of standard make will shortly be on exhibition, on which the commercial practicability of the company's gas producer will be demonstrated. A full description of this device appeared in the Yard and Shop section of December MoToR Boating.

### Marine Supplies Association to Hold Banquet.

The annual banquet and election of officers of the Marine Supplies Association of America will be held this year at the Hotel Marie Antoinette, Broadway and 67th Street, New York City, on the evening of February 21st at eight o'clock. The Association now numbers about 86 members, which is a splendid showing, considering its comparative youth, and it is hoped that this enrollment will be largely increased during the coming year. The Association was incorporated in June, 1908, to bring about more effective co-operation among the marine supply dealers. An important feature of its work is the effort to secure sane and uniform legislation for the industry in which its members are interested. It is not generally realized outside of the Association, even by those in the supply business, how much can be done in this line by such an organization, and how little without it, and that membership brings enormous returns compared with the slight amount required for dues, which, though they are indirect, are nevertheless of real benefit. Only last season, an instance was shown when the Association secured the withdrawal of a set of requirements, which through a technical misunderstanding, bore very heavily upon certain of the members. The Association also takes care of the collection of bad accounts, etc. This organization should be supported not only by the supply men, but also by the ship chandlery men and accessories makers. The dues are only \$10.00 a year, a merely nominal sum considering the benefits received. The officers have given much of their personal time and attention, to say nothing of good hard cash, to the interests of the Association, and they are fairly entitled to liberal support. The following officers served last year, and will probably be re-elected at the annual meeting: President, W. W. Wilcox; vice-president, Chas. D. Durkee; treasurer, John Tiebout, and secretary, Arthur Falk.

### Capital Marine Engines.

Fifield Bros. Company, of Augusta, Me., are offering an interesting line of marine motors this year. Their list of engines includes a single cylinder, medium speed, 5 to 6 H. P., a 2 cylinder, high speed engine developing 10 H. P. at 1,200 revolutions per minute and a 3 cylinder 15 H. P. motor. The Capital motor is a 2 cycle jump spark engine, thoroughly water jacketed and built with both two and three ports. The two port motor has the inlet valve in the base. The medium speed motors are started by turning the balance wheel with the hand, as the range on the timer is long enough so that the motor can be started under slight compression. A starting crank is furnished with the high speed motor, as the

(Continued on page 80.)

### DO YOU KNOW

How much oil to use on your engine—the problems of ignition—the different sorts and how to remedy trouble from this source—the correct pitch for your propeller to obtain the best speed?

DO YOU UNDERSTAND YOUR MOTOR and how to cope with the difficulties that arise and DO YOU KNOW how to make all knots, bends and splices in common use—how to handicap and figure time allowances—the science of navigation—how to caulk and care for your boat—the best cruises to take inland and coast—the routes, distances and full information?

### Yachting

MOTORBOATING...SAILING

"The necessary magazine for all boat owners"—

tells you this each month—and more. It is full of suggestions of others' experiences that will save you much money and time. All Boat Owners will find each month in its profusely illustrated pages, the most helpful articles in the nautical world. Fact and fiction, deep sea yarns, records of all important racing events, club news, plans of boats, racing dates, etc.

As a special introductory offer to all boat owners, we will enter your subscription to YACHTING for two years upon receipt of \$1.00 and at the end of twelve months we will bill you for \$1.50, or \$2.50 in all.

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### A COMPLETE LINE All Styles and Kinds Knocked Down

Sectional and Complete  
Motor Boats, Barges, Ferries, Skiffs, Hunting Boats,  
Made Entirely of Galvanized Steel, Steel Ribs, Keel,  
Bow Stem, Side Plates. No Parts to Rot, Warp, or  
Check. 100 Per Cent. Stronger and Better than other  
boats.



Any Model, Sizes 14 to 75 ft.  
Build your own boats, save 50 per cent. of cost.  
Boat catalogue free.  
RIPPLEY STEEL BOAT CO., Grafton, Ill., U. S. A. Box 199



Send for catalogue R, describing our Knock Down System. Frames, semi-finished and complete Hulls furnished. Designers and builders of all sizes Motor Boats, Cruisers, Tenders and Auxiliary Yachts. Robertson Bros., Foot of Bay St., Hamilton, Can.

# Varnish?

**W**HAT right has a varnish-maker to call his product a "Spar Varnish" if it turns white in water? A varnish which can't stand water is absolutely unfit for use on boats. The turning-white is a sign that the varnish has turned up its toes and died! There is only one varnish on the market which refuses to deteriorate that way. It is



Valspar is the *only* Spar Varnish. In the days before Valspar was invented boat owners were justified in getting along as best they could with the other varnishes, which turned white after every soaking and which required renewal two or three times a season.

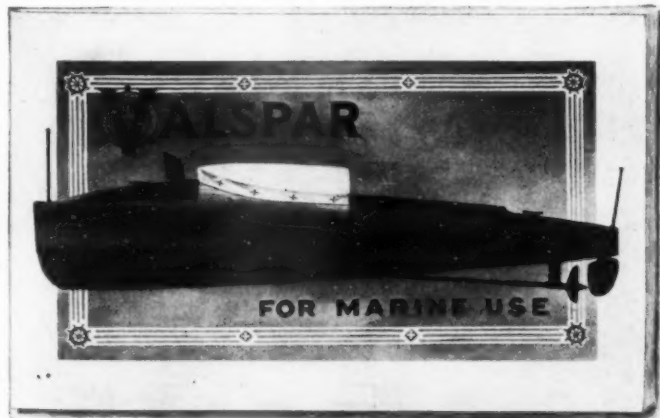
There is no need for such patience now. Varnish with Valspar at the beginning of the season and it will take care of itself till Fall.

Valspar dries very quickly, is tough, very pale and flows nicely under the brush. It marks a new era in Spar Varnish history.

## New Booklet

Send for this new free booklet. It tells the whole story of this new development in Spar Varnishes. You need it as a matter of up-to-date information, whether you are buying varnish at this moment or not. The most progressive naval architects and boat builders are using Valspar now for everything. All the American and English entrants in the International Motor Boat Races last Summer, for example, were varnished with Valspar, although they came from widely separated shipyards. Among the experts the use of Valspar is already standard.

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The new Valspar booklet. Send for it.

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Why be out of date? Why use out of date paint?  
Why scrub off the bottom of your boat?  
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Why not be up to date? Why not buy Bridgeport Bronze Paint and never have to haul or scrub off your boat "in the good old summer time?"  
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Send your address and let us prove it to YOU. To advertise them quickly we will send postpaid an article worth \$1.50. Let us help your engine troubles in wet weather. Guaranteed waterproof. Write now.  
**PURNHAM SPARK PLUG CO., E. Edgcomb, Me.**



**CROCKETT'S Spar Composition**  
—the original and best known exterior marine varnish in the world. The best interior finish is Crockett's No. 1 Preservative  
**Send for Catalogue**  
**The David B. Crockett Company, Bridgeport, Conn.**

**SANDOW MARINE ENGINE**  
8 h. p., 2 cylinder, \$125.00  
4 h. p., 1 cylinder, 57.00  
2 h. p., 1 cylinder, 39.75  
Built Like An Automobile Engine.  
3 to 20 h.p., ready to ship; gasoline or kerosene.  
Drives boats of all kinds; starts easy; cannot backfire; almost noiseless. 6-Year ABSOLUTE GUARANTEE—50-Day Trial. Three moving parts—women and children run it. Demonstrate an engine for us and get yours at cost. Be first in territory to get offer.  
Detroit Motor Car Supply Co., 15 Helen Avenue, Detroit, Mich. (132)



**ASK THE DYNETO ELECTRIC COMPANY**  
Syracuse, New York  
**HOW TO LIGHT YOUR MOTOR BOAT**

**YACHT WATER CLOSETS**  
Save from \$12 to \$22 by installing a SCOUT Closet. As shown, \$29.00  
**Goblet-Dolan Co.**  
32 OLD SLIP, N. Y.



**HAVOLINE OIL**  
**Best by every test**



If you want Good Circulation on your Automobile, Launch or Motor Boat use a **LOBEE PUMP**  
**Lobee Pump & Machinery Co.**  
87 Bridge Street - Buffalo, N. Y.



**POLARIS COMPASSES and BINNACLES**  
Standard quality and absolutely reliable. Write for our catalog and prices.  
**MARINE COMPASS COMPANY**  
BRYANTVILLE, MASS.



## Yard and Shop.

(Continued from page 78.)

balance wheel is smaller and it is harder to obtain sufficient leverage. The motors have a Holley float feed carburetor and are equipped with the Orswell jump spark ignition system. They are lubricated by mixing cylinder oil with the gasoline, thus insuring even distribution of oil to all parts of the motor and the system is economical in that it uses oil only in proportion to the revolutions at which the motor is running. The company also builds engines with one, two, three and four cylinders, in sizes of 2½ to 40 H.P.

### Lighthouse Post Cards.

The Lighthouse Literature Mission of Belfast, Ireland, which furnishes literature to lighthouse keepers all over the world and incidentally publishes the "Lightkeeper," a notice of which appeared in the January MoToR BOATING, Yard and Shop section, has issued some unusually interesting and attractively-made post cards of lighthouses, both in this country and abroad. These cards are made both plain and in colors and a collection of them could not fail to be of interest to any one who has a genuine love for sea lore.

### Safe Mooring.

The Fairhaven Iron Foundry Company, of Fairhaven, Mass., are making a bulb-shank mooring anchor, which has many advantages over the old style mooring and in which the objections to the ordinary type of mushroom anchors are practically eliminated. The Fairhaven holds the ground as hard as any fluke anchor and as it has neither stock nor flukes, cannot foul the chain attached to it. The use of the bulb is two fold. First, it prevents the anchor from standing upright on the bottom and thus becoming a source of danger to all craft in the vicinity in shoal water and secondly, it eases the pull on the anchor by rising slightly from the bottom when the boat gives a sharp pull on the chain in a short sea. The hollow of the mushroom saucer has 4 divisions, the walls of which strengthen the unit of the shank and mushroom and also prevent the anchor from turning in its bed with a rotary movement. An eye is provided on the outside of the saucer in which a small tripline can be spliced and carried to a point on the chain where it can be easily reached at low water. These anchors are made in 17 sizes, weighing from 50 to 1,250 pounds at prices ranging from \$3.00 to \$60.00.

## How to Build a "Knock-about."

(Continued from page 16.)

swelling should take care of it entirely, except for about four feet from the stem, where a little cotton can be driven in. Of course, the seams at the keel and chine should be caulked, also the rabbet at the stem and where the shaft log goes through the keel.

After the caulking is finished, go over the entire outside of the hull with a sharp plane and smooth it up as nicely as you can. This is labor well invested, as a rough boat always looks sloppy no matter what else you do to it. After planing, go over the job with sandpaper and get it real smooth. The seams should be painted with lead paint, using a narrow brush, taking care that the paint is wiped off the edges of the seams, especially under the water line.

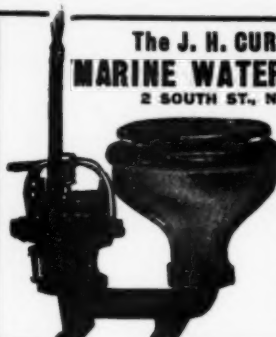
The top sides can then be primed and all the seams and nail holes puttied. Do not put any priming under the copper paint on the bottom, as it will not stick over lead paint, but the seams may be puttied before and the nail heads after the first coat of copper is applied. The top sides and deck should have then varnished with three coats of spar varnish.

The transom, coaming, companionway guides, doors, etc., should be given a coat of filler and then varnished with three coats of spar varnish.

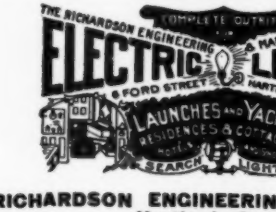
I have not mentioned the installation of the motor itself, as you can get all the necessary information on this subject out of the motor manufacturers' catalogues or representatives.

The top I leave to you to decide upon. There are many styles, both standing and collapsible and the latter, although costing more, is decidedly preferable in a small boat, as it can be stowed when you have to mix up with real bad weather.

**The J. H. CURTISS CO.**  
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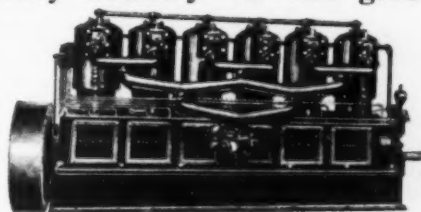
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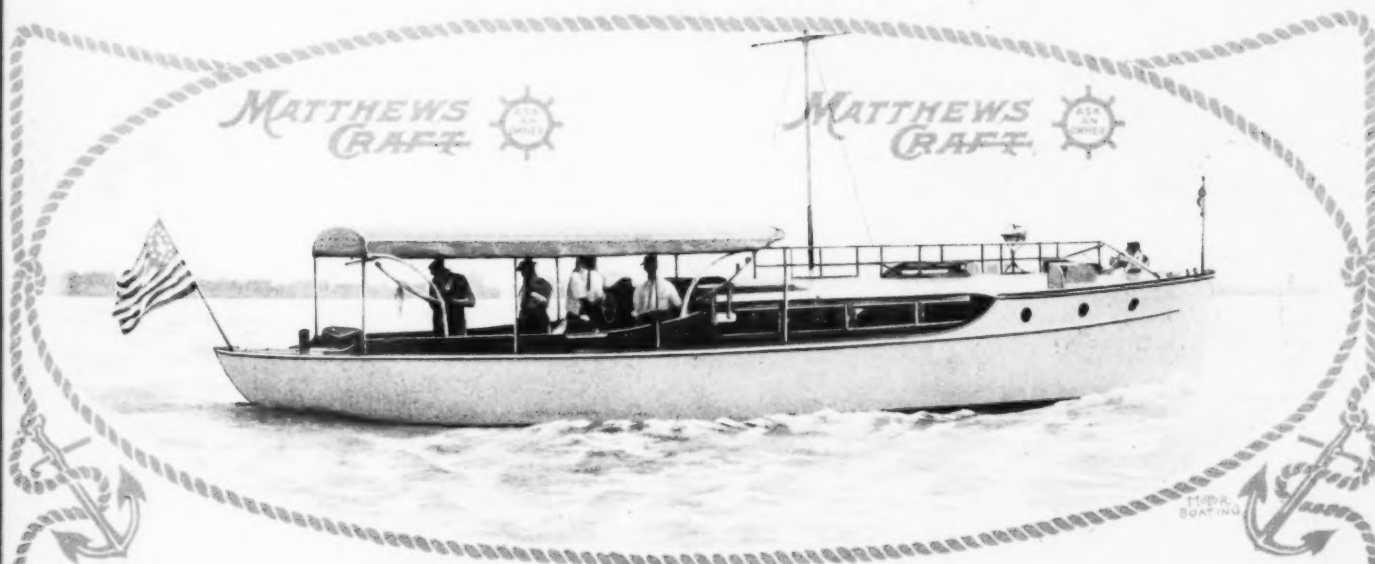
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(Letter received from Alanson P. Brush, Consulting Engineer General Motors Company, Flint, Mich.)

The Matthews Boat Company,  
Port Clinton, Ohio.  
Gentlemen:—

I want to express my appreciation of the co-operation I have received from your entire organization in the working out of the details of the OSPREY'S successor. After a season's use, I still regard OSPREY as a practically perfect 46-footer for the owner who, like myself, enjoys handling his own boat, and consequently appreciates seaworthiness of a very high order, combined with maneuvering abilities that have surprised and delighted me throughout the past summer. OSPREY has not been habited, but has seen a summer's service which included work in rough, open water and navigating of restricted waters where a slip would have meant trouble with a capital "T."

I have to thank, in no small measure, her really exceptional qualities for my ability to return her to your plant undamaged and in as good condition as when she left it.

While, as I have said, I consider your workout of the 46-foot single hander in OSPREY as practically perfect, the making of the new 60-footer, also a practical single-hander, is an undertaking that makes me appreciate the wisdom of your advice "to order early and avoid the need of haste" especially if a prospective owner has ideas which he wants worked out in a practical and satisfactory form.

I am confident, since my last visit to Port Clinton, that, thanks to my early order, the new boat will be as easy to handle as OSPREY, in spite of her greater size.

If my expectations are realized, you will have added another type workout worthy of Matthews construction to your list of unique and successful motor craft.

Yours very truly,  
(Signed) A. P. BRUSH.

The 60-footer referred to is the third Matthews cruiser owned by Mr. Brush. Every craft makes good—ask any owner.

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